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March 1976

Smithsonian

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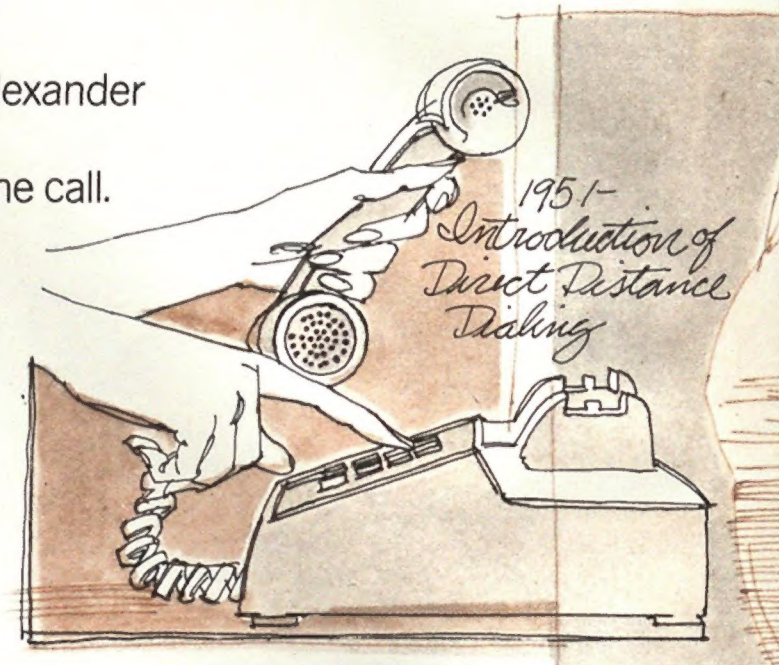
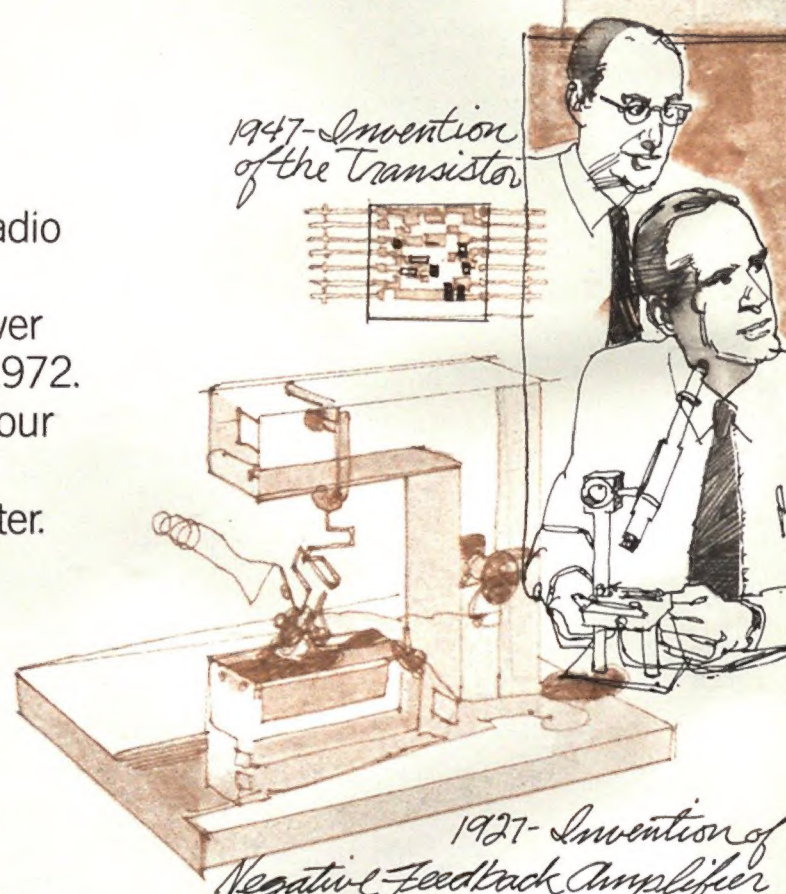
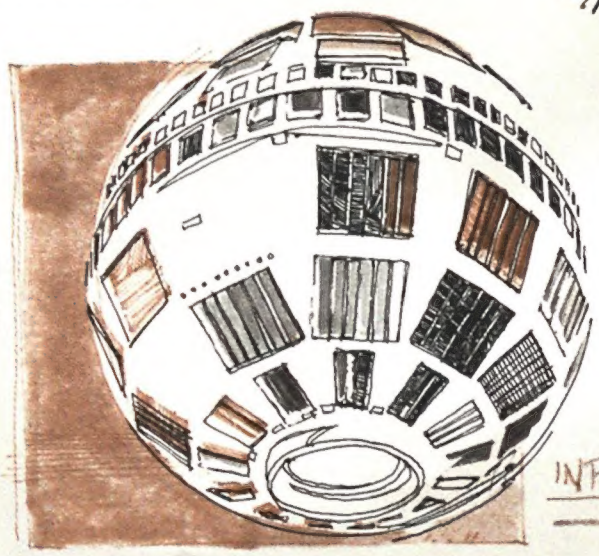


1951- Introduction of Direct Distance Dialing

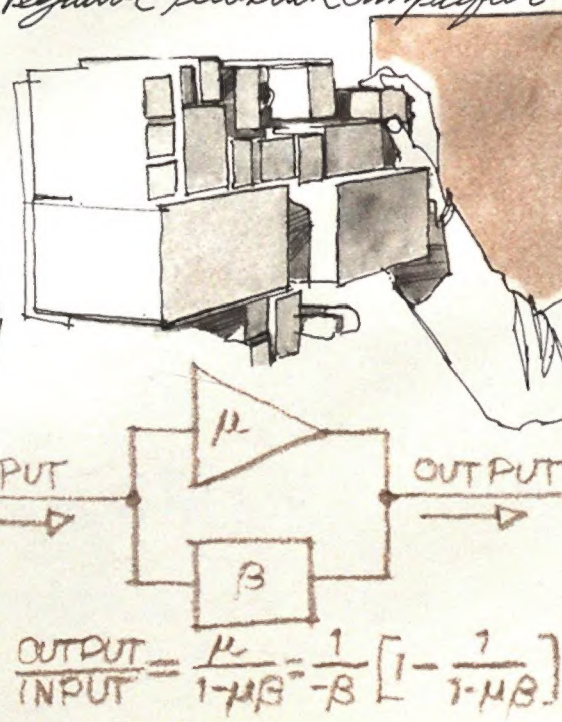


1947- Invention of the Transistor

1927- Invention of Negative-Feedback Amplifier

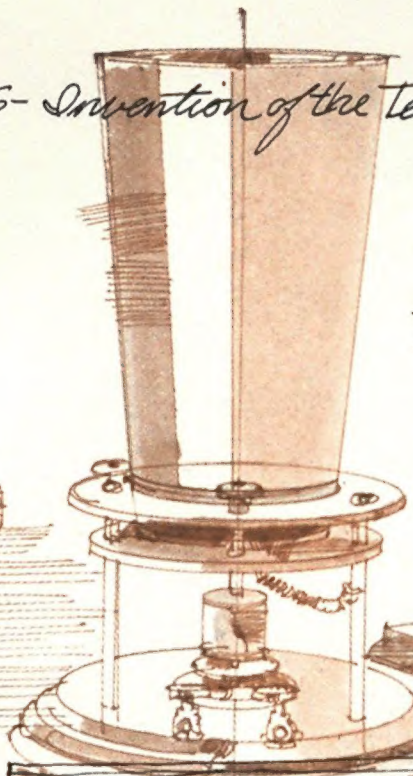


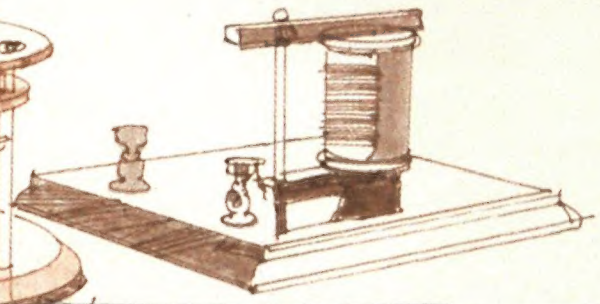
1962- Launch of Telstar™ Communications Satellite



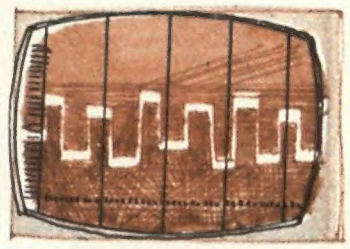
YOUR NEXT PHONE CALL

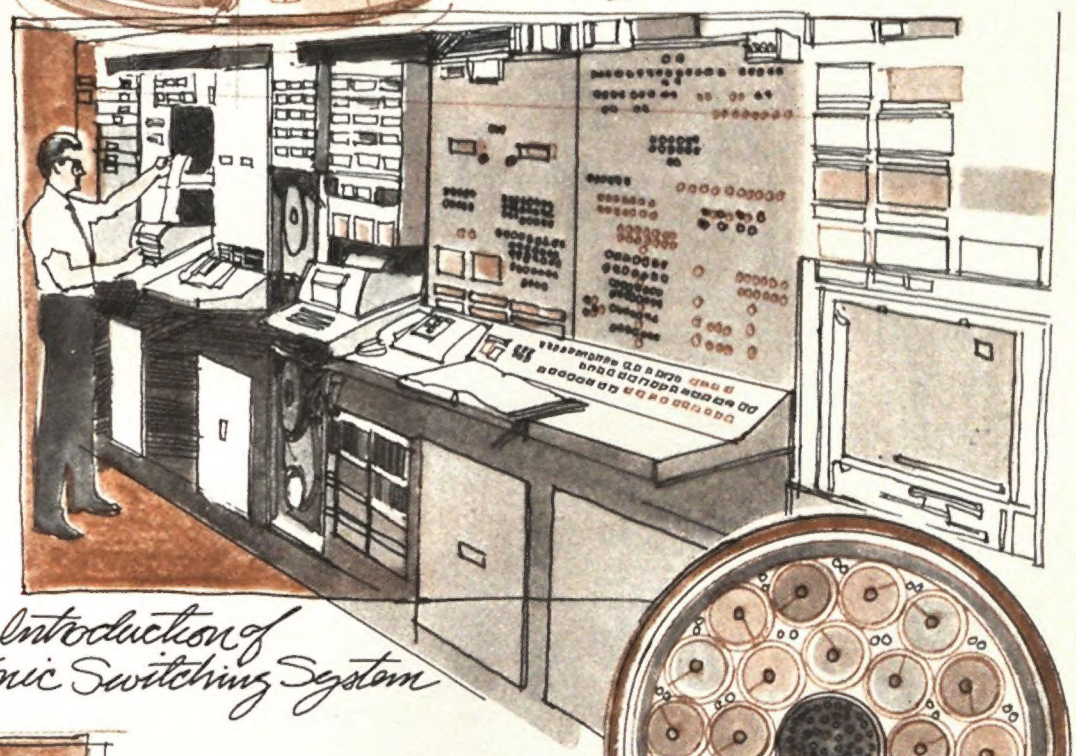
1876- Invention of the Telephone



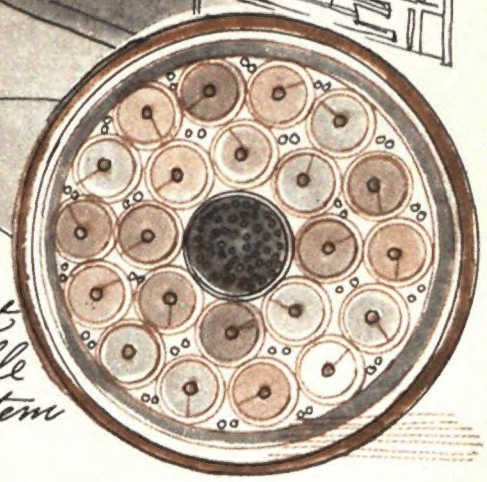


1962- Introduction of Digital Transmission System

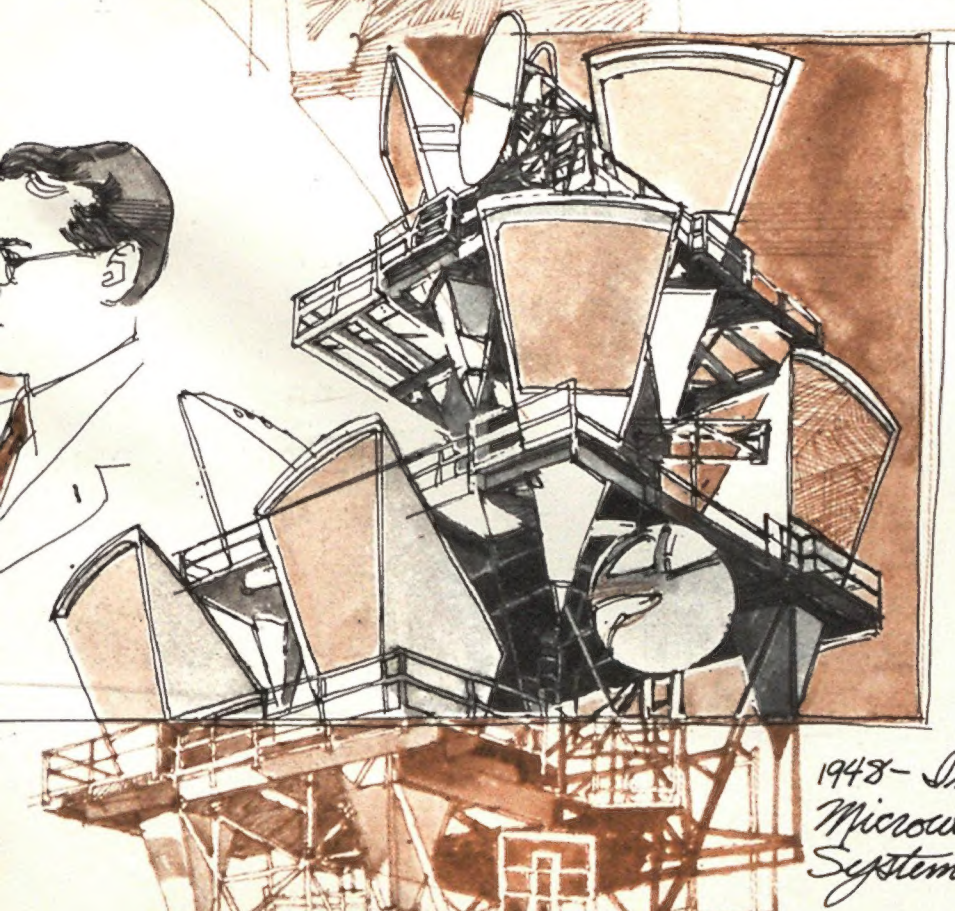




1960- Introduction of Electronic Switching System



1929- Development of Coaxial Cable Carrier System

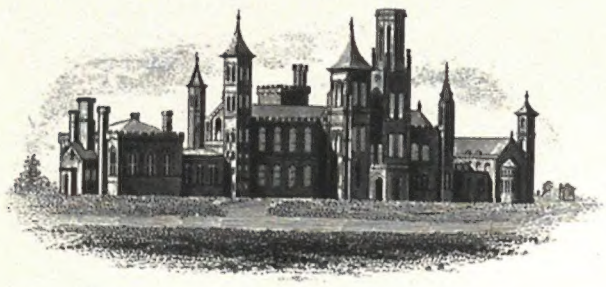


1948- Introduction of Microwave Transmission System

Bell Labs
Western Electric

Secretary Ripley's comments

The view from the castle



The work of Smithsonian astrophysicists ranges from black holes and the origin of the universe to the sun and the Earth

From a modest beginning in 1890, when Samuel Pierpont Langley, third Secretary of the Institution, established a small laboratory in a wooden shack behind the castle, the Smithsonian Astrophysical Observatory has grown to a $10 million-a-year operation engaging more than 100 scientists (plus another 250 members of the supporting staff) in a broad program of research ranging from the search for black holes to the study of the origin and evolution of the universe.

Headquarters for these investigations is in Cambridge, Massachusetts, where the Astrophysical Observatory has joined with the Harvard College Observatory to form the Center for Astrophysics. Under the directorship of Professor George B. Field, the two observatories combine scientific staffs and facilities to expand the frontiers of modern astronomical thought.

In high-energy astrophysics, for example, the Center is preparing a series of experiments for flight aboard NASA's upcoming series of x-ray satellites. In collaboration with the University of Arizona, the Center is constructing a large, multiple-mirror telescope for optical and infrared astronomy that will be the world's third largest instrument. And, with the support of NASA, the Center operates a worldwide network of cameras and lasers to track artificial satellites with such precision that the distances between ground stations separated by thousands of kilometers can be determined to within two centimeters. Models of the Earth's shape and size derived from this accurate data can be used to study Earth and ocean tides, polar motion, even continental drift.

Obviously, these ambitious and diverse research goals, demanding extensive laboratory facilities, large observational data bases, and high-speed computational capabilities—not to mention a variety of scientific skills and talents—can be accomplished only in consortia, as joint enterprises that combine the special resources of several institutions to achieve excellence. Precisely such an effort is the Smithsonian-Harvard Center for Astrophysics.

Interestingly enough, the newest area of joint study for this most modern of research centers is a subject that inspired the founding of the original observatory in 1890—the sun. The Langley-Abbot solar physics program, named in honor of founder Langley and the fifth Secretary, Charles Greeley Abbot, both of whom were solar astronomers, will use data returned by Harvard experiments aboard the Skylab satellite as the basis for studies of physical processes in the solar atmosphere. Following the tradition of Abbot, the program is also concerned with the relationship between solar energy and the Earth's environment.

At a recent American Association for the Advancement of Science meeting in Boston, the Center organized a national symposium on "The Magnetically Varying Sun and Its Effects on Terrestrial Climate" to explore the apparent correlations between solar activity and the weather.

In a very real sense, this new program fulfills what Langley termed "the fair dreams for the future of our science." That remarkable pioneer foresaw the limitless potential in the sun and predicted that astrophysics was "destined to grow and, in its maturity, apply solar energy to the use of mankind."

S. Dillon Ripley

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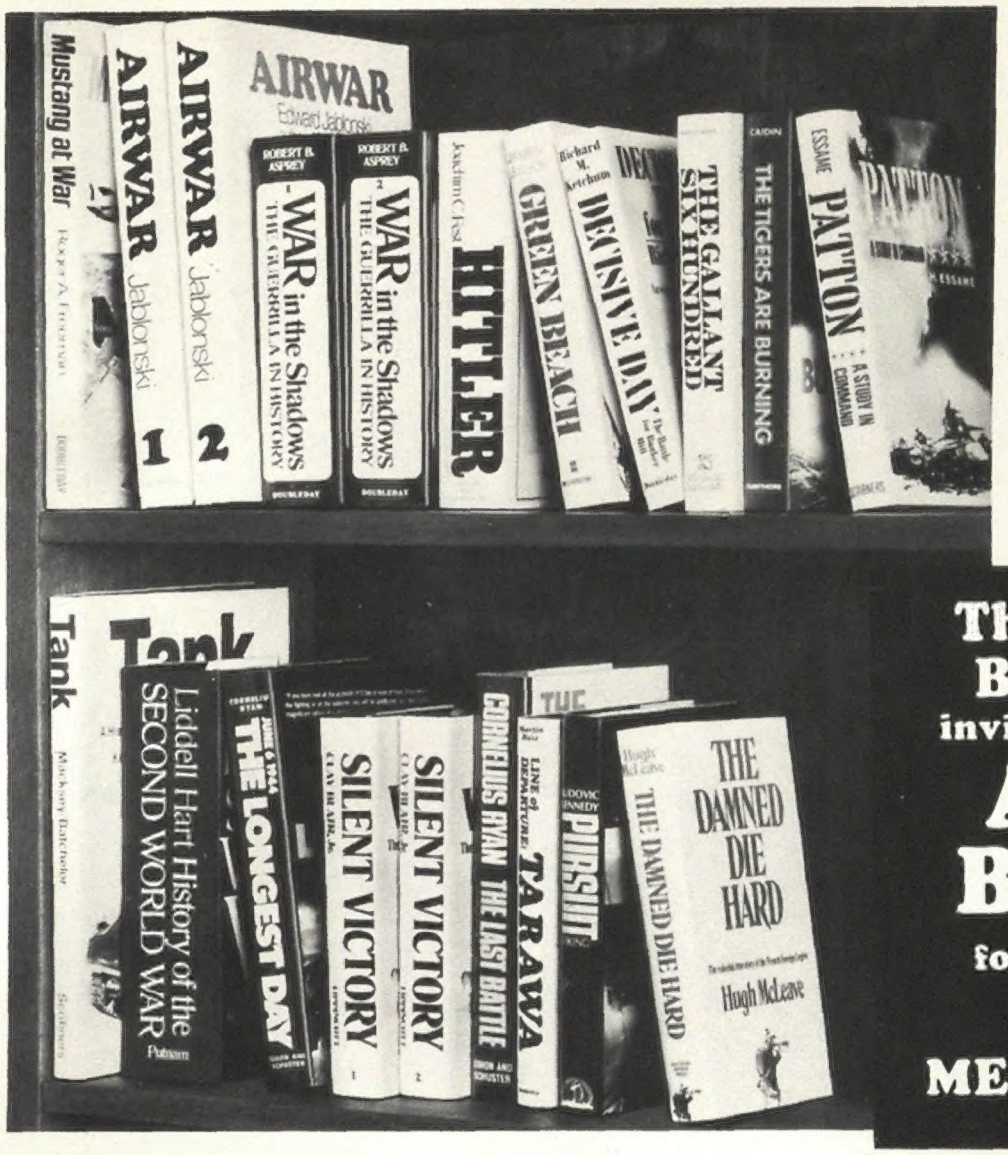

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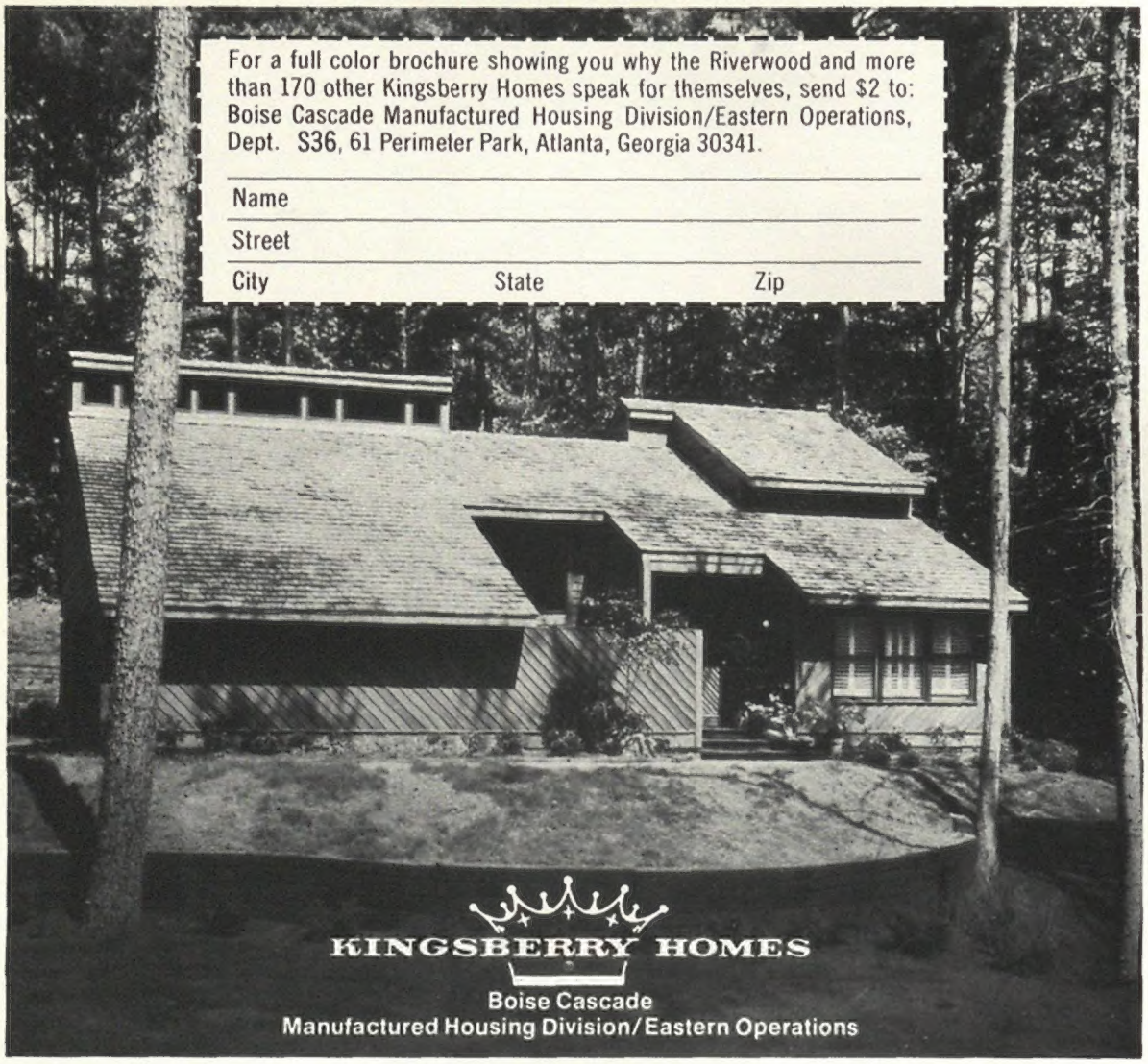
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Phenomena, comment and notes

How Roo may have navigated, chaos in air quality, family planning among buntings—ecofunerals

In these days of searching for ecological and energy-wise solutions to everything, it seems reasonable to look at the small Parsi community in Pune (Poona), India, which traditionally has a very direct biological means for disposing of their dead. They put corpses up on top of the Tower of Silence where scavenging vultures soon arrive and "ensure timely disposal."

According to Bombay's *Free Press Journal,* however, there's trouble on the Tower of Silence—thanks to a suicidal Parsi gentleman who recently did himself in with cyanide. Subsequently a number of the helpful vultures died of the same cause, and the rest apparently took note and decided to boycott the holy place.

The quokka question

A most appealing aspect of marsupials is their diagnostic feature—the pouch. Sentimentalists coo at the thought of the newborn kangaroo crawling up its mother's stomach and tumbling into the warmth and safety of her welcoming pouch, later to peek out beguilingly. But how does the baby know how to get there? It can't see, after all.

It has nostrils, so it may smell its destination; what scientists call chemotaxis. However, looking at opossums, some researchers have suggested that the newborn reacts to gravity, though how it could do so with such poorly developed inner ears (where the sense of balance is found) is a mystery.

Now four Australian scientists, writing in *Nature*, (Volume 259, Number 5538), claim to have settled the question once and for all, at least for quokkas. Among several laboratory observations they made, they tilted a newly delivered quokka mother slightly off the vertical. Her newborn steadfastly headed straight up, thus missing the pouch by one centimeter. Then the mother was turned head down: the little joey turned around and went toward the pouch.

So, however they sense gravity, baby quokkas make their first voyage by navigating on the basis of what is called "negative geotropism."

Proving the obvious

Children, it has long been suspected, are dangerous to the health of adults, and British investigators have now documented one way this is true.

Primary schoolchildren were invited to scream into a sound level meter. The mean level of some 200 screeches was 114 dBA. The highest was a 12-year-old girl who logged in at 122 dBA, which, according to *New Scientist* (Volume 68, Number 980), is at the threshold of listener pain. A four-year-old reached 111 dBA.

What is generally considered a safe noise level for extended periods of time is 90 dBA. So now it is proved that children can be a specific occupational hazard for teachers who run a noisy class or who mind the playground.

An old fish story

The coelacanth (pronounced see-la-canth) is a fish that has been much misunderstood by scientists, though much admired. In the first place, it was long supposed to have been extinct for 70 million years until one turned up in 1938, caught by fishermen off the coast of South Africa.

Since then, this lobe-finned fish, thought to be a direct precursor of the four-legged animals and therefore of us (though even this is now in doubt), has turned up often on fishermen's lines: some 85 have been taken from the Indian Ocean off Mozambique. But none has been captured alive, which has left biologists guessing about some of the coelacanth's most intimate biological processes—reproduction, for example. Is it oviparous (bearing eggs) or ovoviviparous (bearing live young)?

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In the absence of a clearly identifiable sex organ capable of internal fertilization, the fish was said by many biologists to be oviparous, but others wondered about the small number of large eggs found in some specimens. Too few, they thought, to insure survival.

The puzzle now has been solved by icthyologists at the American Museum of Natural History in New York. Dissecting what turned out to be a gravid female (which had been in the museum's collection for more than a decade), they found five fully formed young coelacanths.

So the coelacanth is ovoviviparous. Now, isn't it nice, these days, to have *something* settled?

Air quality index

There is practically no way the citizen can really tell what is meant when the radio announcer gives the air quality index as part of the weather forecast. It is especially confusing if the citizen travels very much.

According to *Environmental Science and Technology* (Volume 10, No. 1), the President's Council on Environmental Quality made a survey in 1974 and discovered that among the 33 largest U.S. cities, no two indices were the same. They differed in such things as the number of pollutants counted, and in the manner in which they were interpreted.

So, in combination with several other federal agencies, the Council has been developing guidelines for a standardized index, which will be released next month. There's no way to force all locales to use a standardized index, but it does seem to make sense that we all get the bad news in the same format.

Medical clues

If your fingernails are distinctly darker at the tips, then you have chronic kidney failure and you should get to a doctor right away. Researchers at the University of Mississippi Medical Center say they have "found the half-and-half nail to be a highly specific sign, according to *Medical World News* (Volume 17, Number 1).

It was already known to medicine that uremia makes Lebanese dark and Scandinavians yellow, so Mississippi's John D. Bower began looking for other physical clues. He examined the nails of kidney failure patients, people chronically ill

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from other causes, and some healthy people. The half-and-half nail, which is a result of melanin being deposited in the nail bed, was found exclusively among patients with chronic kidney failure—though not all such patients have it. In any event, it can serve as a valuable diagnostic clue for GPs.

Meanwhile, one finds in the same issue of *Medical World News* that doctors are seeking clues to the identity of another affliction. It seems that someone is sufficiently disgruntled with the policies of the American Medical Association to be swiping its documents and leaking them to the press and to federal investigators. AMA staffers say they know who it is but cannot prove it. They also say the informant is no doubt connected with the Church of Scientology, which the AMA considers a suspect cult. The informant, in phone conversations, says he's not so connected at all.

Of course, the informant is known as Sore Throat.

Redoing history

There is a move afoot to make a science of history. It is being attempted by mathematically minded historians who call themselves "cliometricians" and apply to the past the techniques of mathematical and statistical analysis used by the social sciences. While this sounds distressing to those for whom history has always been, among other things, a "good read," the cliometricians are turning up some surprises in American history, according to *Mosaic* (Volume 7, Number 1).

- For example, most historians believe the Civil War gave impetus to U.S. industrialization but that the economy stagnated in the 1870s. Precisely wrong. Manufacturing sagged in the 1860s and per capita income in the '70s grew faster than any time afterward until the second World War.
- In the 20 years before the Civil War, per capita income in the South was not stagnating but grew as fast, probably faster, than in the North, though presumably from a lower base.
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• In analyzing the westward movement and migration from rural to urban areas in the 19th century, cliometricians found that these great movements of people "dwarfed" the more recent migrations to the cities that have given modern municipal governments fits in the last few decades. This may be small comfort to our beleaguered mayors.

One can only wonder which of our current certainties about efficiency and growth will be turned upside down by future cliometricians.

Advice for females

In the cold of what one hopes is the end of winter, one's eye is alert for reminders of warmer seasons and *Science* (Volume 190, Number 4221) brings one—a report on the indigo bunting. When you are driving past farmland in summer east of the Mississippi and, out of the corner of your eye, see a fleck of the brightest blue in the world perched on a fence, *that* is an indigo bunting.

Now there is a theory that monogamy is generally a good thing for birds since it doesn't dilute the male's child-rearing efforts and also keeps population density in line with resources. There is a theoretical exception: if critical resources are unequally distributed, if there is a wide range of quality of territories, polygyny may work well.

Two zoologists, Michael Carey and Val Nolan jr., at Indiana University found these conditions in Bloomington and set out to see if the buntings followed theory. They found that the males spend more time singing for mates than most other passerine (perching) birds, that some young males are slow to develop the sexy blue coloration, that there is a great deal of bickering over choice territories, and that some ten percent of males had two mates simultaneously, enough to qualify indigo buntings as polygynous. They never saw a polygynous male helping out with the kids.

Finally, females mated to polygynists produced just as many young as their more conservative sisters. So, in the words of the authors, which presumably should not be extended to human ecology, a female's success "may be greater if she chooses a mated male rich in resources rather than an impoverished bachelor."

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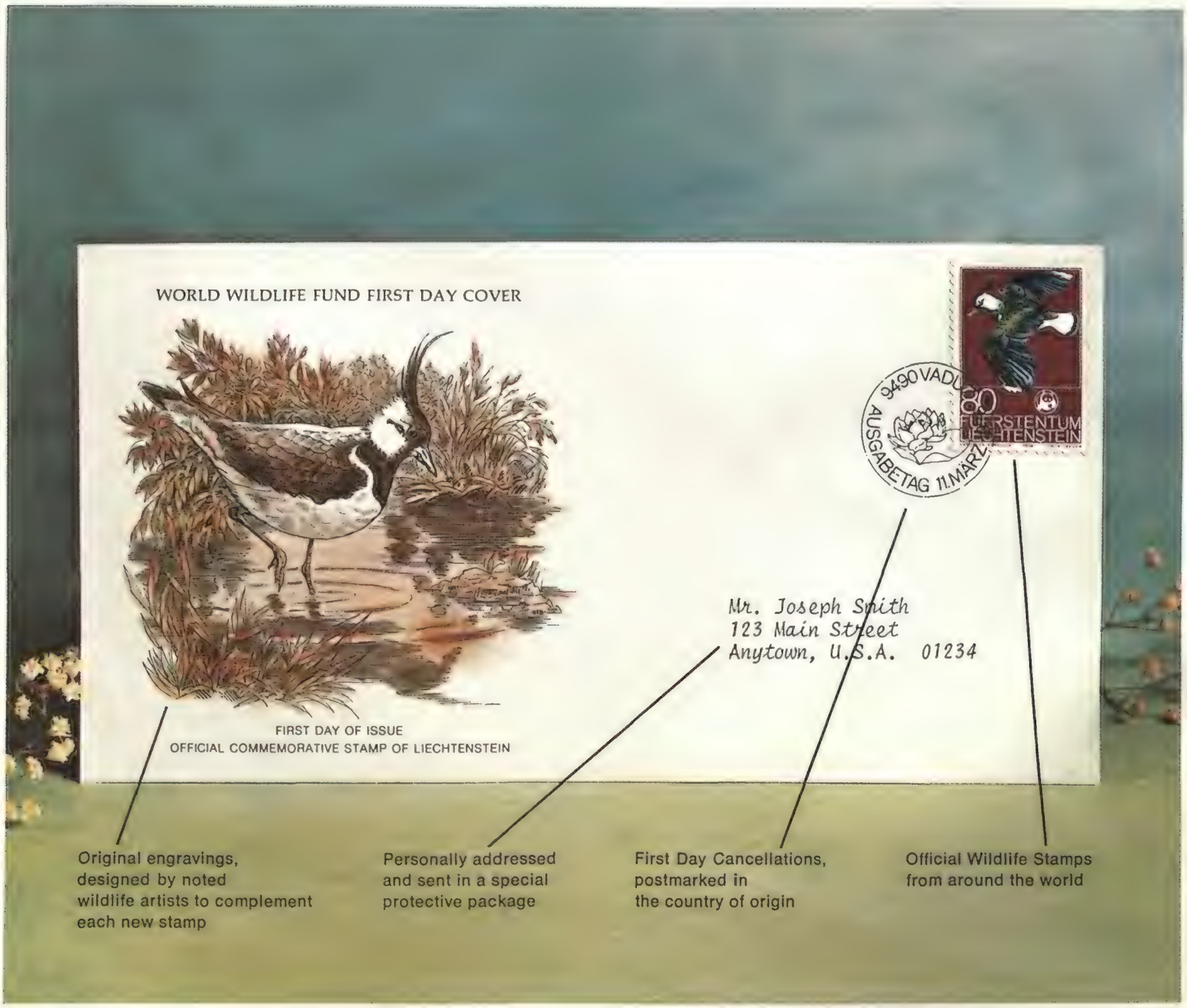

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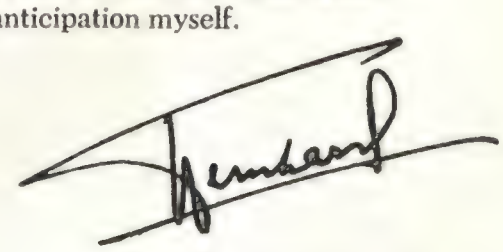
I am sure that you will obtain great satisfaction from this collection, and I look forward to it with warm anticipation myself.



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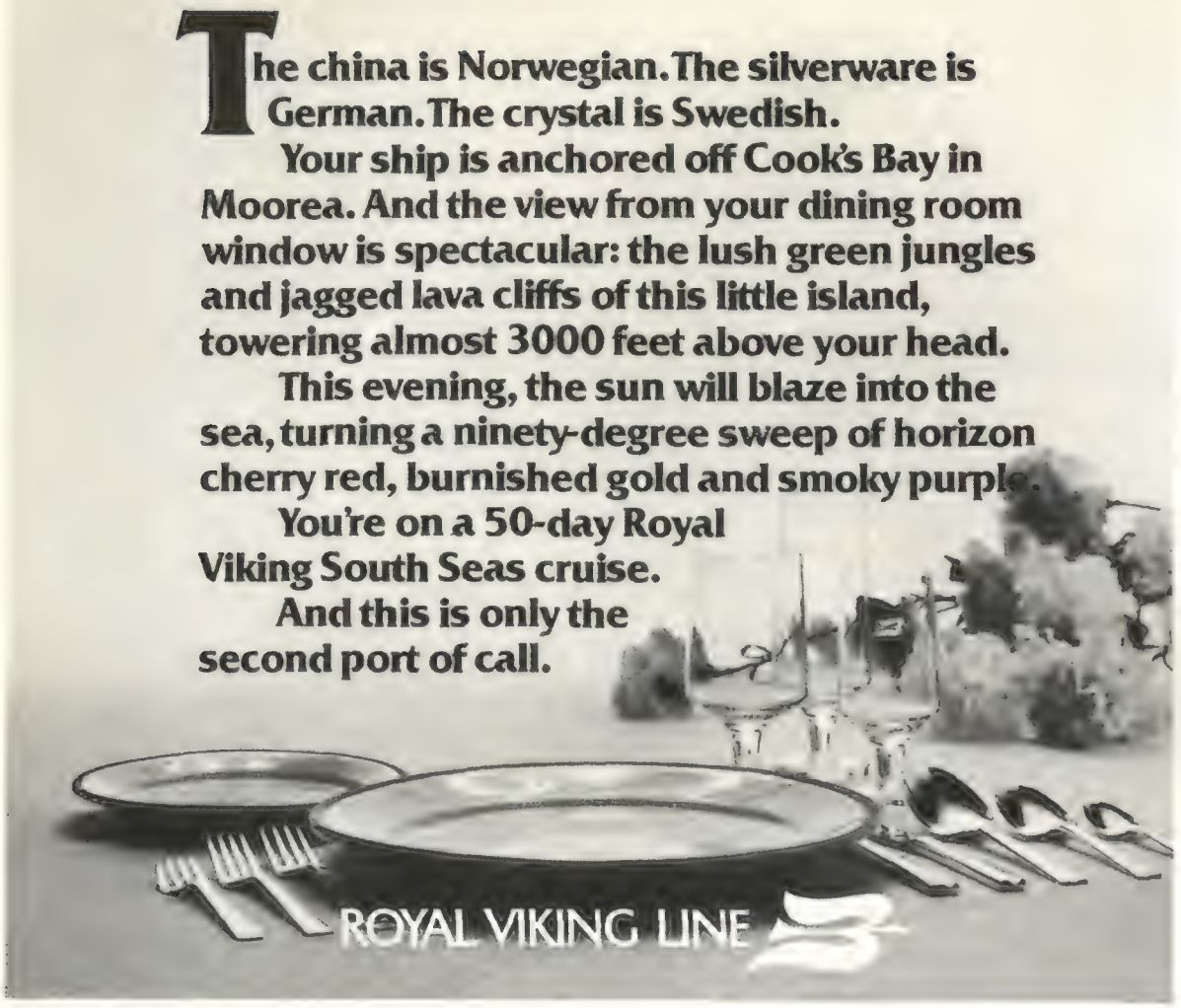
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Letters to the Editor

Philae

Dear Sir: In regard to your stunning article on the temples of Philae in the February issue, one point needs clarification. I am a member of the Smithsonian staff responsible for preparing the request to the U.S. Congress for permission to draw on the large U.S.-owned accounts of Egyptian currency which have been the source of the $2 million American contribution to this salvage undertaking. I believe you have exaggerated the portion of the salvage costs which the United States might bear officially, not counting possible private donations. About one-fourth, not one-half as you stated, of the total cost is the amount of Congressional authorization Smithsonian is seeking for Philae. To date, more than $7.5 million has been pledged or received from other countries, exclusive of official U.S. and Egyptian contributions.

Kennedy B. Schmertz, Director,
Smithsonian Foreign Currency Program
Washington, D.C.

James Smithson

Dear Sir: Melville Bell Grosvenor's article on James Smithson in the January issue raises one curious question. The article states that Smithson was born, illegitimately, in 1765 and died the 26th of June, 1829. This makes him, as you stated, 64 at his death. However, in studying your photograph of Smithson's tomb, I noted that it states he died in June 1829, age 76. Which is correct, 64 or 76?

John A. Webster
Tallahassee, Florida

Smithson was 64. His nephew, Henry

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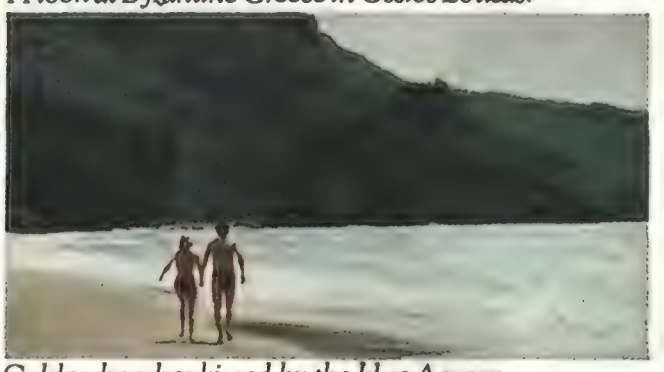

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James Hungerford, who erected the handsome monument, did not know his uncle's birth date and gave him 12 years too many. Ed.

Baja California

Dear Sir: The reality of progress is writ large anywhere in the world; for Baja it came sketched with a blacktop ribbon down the peninsula, accentuated with flashes of reflected light from soda-pop cans, foil and cartons that litter its path.

In the Himalayan reaches of Nepal, each mapped trekking trail is similarly littered with the detritus of "civilized" visitors. To retool the oft-heard phrase, "It is better to light one candle than curse the darkness," I would posit "Better to have each person responsible for carrying out whatever he carries in." Without a responsible citizenry, we cannot hope for unmarked wilderness.

Lawrence R. Przekop
California State University
Fullerton, California

Dear Sir: Your opening photograph in the Baja article labeled boojum along with cardon as cacti. It may look like a cactus, but its correct identification is *Fouquieria [Idria] columnaris.*

Meredith Lane
Tempe, Arizona

Homesteaders and swans

Dear Sir: One photograph in your article on the Turner family taking care of the swans in the wilds of British Columbia brought tears to my eyes—their horse, with its ribs showing, looks so underfed.

Mrs. L.W. Lynett
Greenwich, Connecticut

Dear Sir: Trudy Turner should not be cruelly reining in her team of horses.

Hazel Reeder
Brooksville, Florida

Dear Sir: I was particularly struck by the statement, "There will be no third generation of homesteaders: both the Turner and Edwards farms now fall within the boundaries of Tweedsmuir Provincial Park." If the swans (an endangered species) belong, the Turner-Edwards family does too—and for the same reason.

Edgar P. Wyman
North Sandwich, New Hampshire

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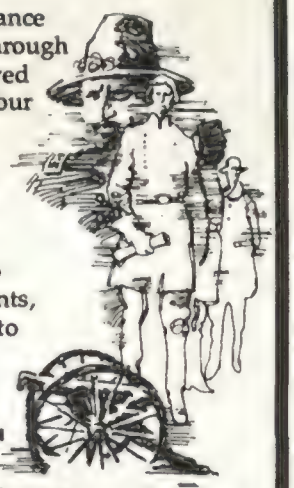

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William Thompson
Chicago, Illinois

Alfred Eisenstaedt's Sister Mildred

Nadelman's *Woman at the Piano*

John Law's bubble

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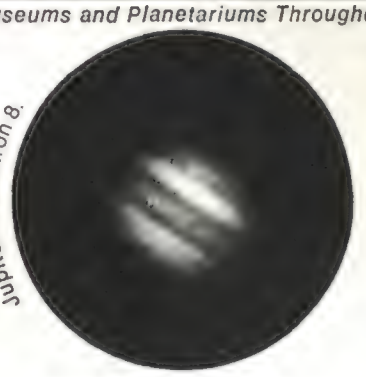
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article on John Law that "an aristocratic young lady who was descended from Anne Boleyn left her French husband to wander around the Continent with Law." It's time people were a little more careful about forebears.

Eleanor Leadbeater
Alexandria, Virginia

Lady Catherine Seignieur was a collateral —not a direct— descendant of Anne Boleyn. She was a direct descendant of Anne's father, Sir Thomas Boleyn. Ed.

Singapore's Chinatown

Dear Sir: In your splendid article on Singapore's Chinatown, there is one photograph referring to "acres of junks." Those boats surely do not appear to me to be junks.

Alice Chapelle
Rehoboth, Delaware

The boats are mostly lighters, ranging in size from 30 to 50 feet, used to transfer goods from large ships in the harbor to docks along the Singapore River. Ed.

Phenomena, comment and notes

Dear Sir: Eckhard H. Hess' recent demonstration that women with large pupils are very attractive to men is a rediscovery of something that was apparently well known to ancient man (or, more specifically, ancient woman). The plant *Atropa belladonna,* also known as "deadly nightshade," was probably named for its two major uses at the time: a lethal poison and a beauty aid. Atropos was the Greek Fate who severed the thread of life; "beautiful ladies" used a preparation of the plant in their eyes to widen the pupils and increase their attractiveness.

Tincture of belladonna and its major alkaloids are still used in medicine and are, indeed, valuable drugs, although the goals of current therapy usually do not include increase in comeliness as they once did.

Melvin H. Rodman, M.D.
Cambridge, Massachusetts

Dear Sir: It was with some dismay that I learned from James K. Page's column of the unpleasant characteristics attributed to persons whose eyes have small pupils. Medication commonly used in the treatment of glaucoma (pilocarpine, for example) causes the pupils to remain constricted, giving the patient a beady-eyed

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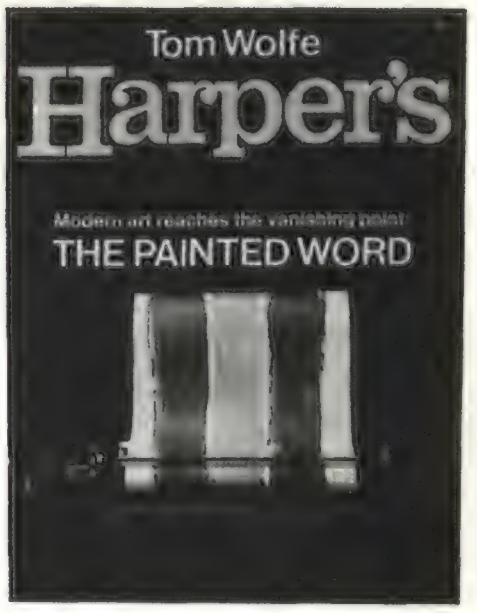

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You'll enjoy exclusive essays like George Plimpton's cutting satire of the sports book macho mania, William Saroyan's view of Michael Arlen's best-seller. Jose Yglesias on Harriet Beecher Stowe – reversing unjust neglect. Richard Adams paying his respects to the classics of childhood in "Ingredients of Watership Down." And "discoveries" by Tom Wolfe, Evan Connell, and other noted authors.

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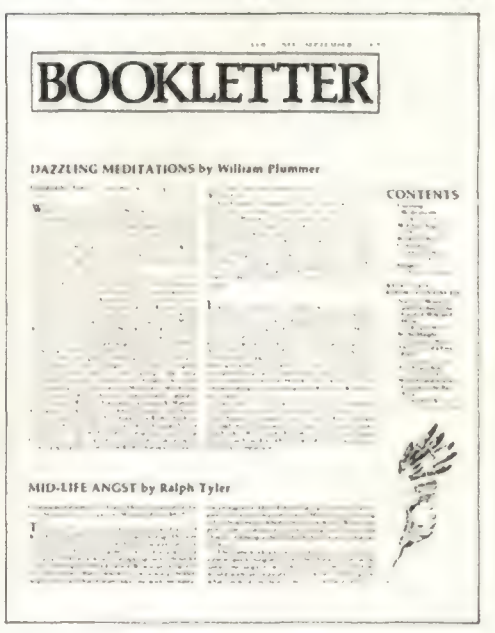

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appearance. This may be useful to serious poker players, whose pupils won't dilate at the sight of a royal flush. Nonetheless, if glaucoma victims, under medication, are destined to go through life unattractive to the opposite sex, disliked by children and considered the possessors of negative attributes, it is a sorry prospect.
P.J. Long
Tarboro, North Carolina

Dear Sir: In reference to the item, "Unwanted phone call," Mr. Page may be interested in knowing that the telephone company will arrange an "off" switch on home telephones. This is accomplished quite simply by removing the bottom plate and adjusting the "soft-loud" control to provide for an off position. The problem is in remembering to turn the phone back on after a peaceful and uninterrupted evening.
David B. Letteney
Little Silver, New Jersey

Greenwood "eara" of earmuffs

Dear Sir: As with all inventions, Chester Greenwood's earmuffs were born of necessity. It is interesting to note that his "Ear-mufflers" patent application of February 8, 1877, became an issued patent on March 13, a mere matter of five weeks.

His second patent application of February 2, 1935, issued as Pat. No. 2,066,036, (metal rake) on December 29, 1936, took 23 months; it was granted to him at 78, the year before he died.
Imre D. Gregor
Patent research analyst
Rockville, Maryland

Dear Sir: Author Richard Pritchett might be interested to know that finding earmuffs today is like panning for gold—almost impossible. They're not in the Sears catalog, nor does L.L. Bean in Freeport, Maine, list them.

I have been looking for some for more than a year—probably sounds ridiculous considering where I live, but I have Chester Greenwood's problem and play tennis year round.

I finally found earmuffs in the Christmas Lord & Taylor catalog—fur earmuffs for $8! I have been stopped numerous times by people who wanted to know where I bought them.
Mrs. Gordon W. Harvey
Houston, Texas

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STATEMENT ON

THE REAL CRISIS

THE WORLD as we know it will likely be ruined before the year 2,000 and the reason for this will be its inhabitants' failure to comprehend two facts. These facts are:

1. World food production cannot keep pace with the galloping growth of population.

2. "Family planning" cannot and will not, in the forseeable future, check this runaway growth.

The momentum toward tragedy is at this moment so great that there is probably no way of halting it. The only hopeful possibility is to reduce the dimensions of the coming disaster.

We are being misled by those who say there is a serious food shortage. This is not true; world food production this decade is the greatest in history. The problem is too many people. The food shortage is simply evidence of the problem.

It makes no difference whatever how much food the world produces, if it produces people faster.

Some nations are now on the brink of famine because their populations have grown beyond the carrying capacity of their lands. Population growth has pushed the peoples of Africa, Asia and Latin America onto lands which are only marginally suitable for agriculture. No amount of scientific wizardry or improved weather will change this situation.

For a quarter of a century the United States has been generous with its food surpluses, now vanished. We have given at least 80 billion dollars worth of food and development aid since World War II. The result? Today, the developing world is less able to feed itself than it was before the massive U. S. aid program began. A generation ago, the population of poor countries was increasing by 16 million a year; now it increases by 67 million each year and the imbalance grows.

Furthermore, our past generosity has encouraged a do-nothing policy in the governments of some developing nations. At the 1974 United Nations meetings in Bucharest and Rome, spokesmen for these nations asserted, incredibly, that they had no population problem. They defended these twin policy statements:

1. The hungry nations have the *right* to produce as many children as they please.

2. Others have the *responsibility* to feed them.

We believe that these statements are irresponsible and indefensible. Any nation that asserts the right to produce more babies must also assume the responsibility for taking care of them.

Some speak optimistically of progress within the hungry nations as evidenced by the modest acceptance of family planning programs in many countries. "Family planning will succeed," they tell us. But how is this possible? Family planning advocates, to gain acceptance, insist that parents everywhere may have as many children as they desire. If the number of children wanted had always been two (on the average) we would not now have a population problem. The crisis exists because parents want more than two children.

In Moslem countries, for example, the desired number of progeny per couple is "as many as God will send." This turns out, on the average, to be seven.

The country which has spent the most money on family planning over the longest period of time (India—24 years)

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BEHIND THE "FOOD CRISIS"

has accomplished virtually nothing. Its population in 1951 grew by 3.6 million. Now it grows 16.2 million each year. Mexico adopted family planning only three years ago and the birth rate there has abruptly risen.

Yet many people insist that it is our moral obligation not only to continue but to increase our aid, totally overlooking the fact that it is impossible, from a practical standpoint. Eighty percent of the world's grain is not grown in the United States. All that we can sell or give away amounts to only 6% of the world's production and less than three years' population increase, alone, would consume this.

There can be no moral obligation to do the impossible.

No one really likes triage — the selection of those nations most likely to survive and the concentration of our available food aid on them. The question can only arise if we should reach the point where the world population outruns food resources. When such a situation arises, some people will die no matter what the disposition of the inadequate food supply will be. In that event, some hard decisions will have to be made.

At some point, we in the United States are going to find that we cannot provide for the world any more than we can police it.

In summary, our position is this: The sovereign right of each nation to control its own reproduction creates the reciprocal responsibility to care for its own people. The U. S. can help and will — to the limits of our available resources.

The belief that the crisis results from a "shortage" of food leads to disaster. Attempting to deal with this by producing and distributing more food, **while doing nothing about population,** is incubating disaster.

We must not permit our aid to underwrite the failure of some nations to take care of their own. When aid-dependent nations understand that there are limits to our food resources, there is hope that they will tackle their population problems in earnest.

We owe it to posterity — ours and that of the rest of the world — to promote policies that lead to solutions instead of catastrophe.

The Environmental Fund does not solicit memberships or contributions, but, if you, too, are concerned about the issues raised in this Statement, and would like to be on our mailing list, let us know.

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In China, a breath of fresh air brightens up the official palette

Peasant painters of Hu-hsien, 600 miles from Peking, are creating a joyously refreshing communal art free of stultifying party control

By Rudolph Chelminski

Photographs by Pierre Boulat

The basic task of socialist literature and art is to work hard and create heroic models of workers, peasants and soldiers.

—Lin Piao

There is no such thing as art for art's sake.

—Mao Tse-tung

All such bourgeois and revisionist trash must be resolutely opposed.

—Lin Piao

As any Maoist would say, I have taken large liberties in abridging and juxtaposing the quotations above; moreover, I have compounded sin by sacrilege in citing Lin Piao at all, since he has been resolutely disgraced and consigned to Chinese oblivion. Still, the juxtaposition isn't altogether gratuitous. In a few brief lines it sums up what for the last 18 or so years has been the official Chinese attitude toward esthetic expression: the purpose of art was to serve the soldier, the peasant and the worker—and, most of all, the party. It was to be militantly revolutionary, and nothing else.

Parisians, however, were privileged to be the first to see the breathtaking and now-famous exhibit of ancient archaeological treasures unearthed since the new order came to power (SMITHSONIAN, September 1973). It was evidence that, despite reports, the excesses of the Cultural Revolution had not eroded China's basic respect and admiration for its artistic patrimony. Now a second show has been seen in Paris. Certainly it is less majestic than the first, but in its own way it is just as revealing. It is the outside world's first chance to see actual examples of a new kind of contemporary Communist art and—surprise—it is even decoratively entrancing. It is the work of the peasant painters of Hu-hsien.

Peasants in a pattern on lotus pond harvest fruit from carpet of plants. Bright red tractor adds a note of both utility and decoration.

The 80 gouaches in the exhibition, which was seen at the Musée Galliera as part of the Paris Biennale, represent a selection from the astonishing total of 40,000 paintings turned out over a 15-year period by 600 self-taught and apparently tireless rural amateurs. Every painting is the result of spare-time application at day's last light or under electric lamps, after a full work shift in field, office or barn. They are, in fact, very close to being acts of love; and, without wallowing too deeply into the marshes of speculative sinology, we may say that the mere presence of this art in the West indicates that the Chinese now seem to be in a period of comparatively relaxed ideological vigilance.

As far as art is concerned, it could not happen too soon. The barren desolation of "state" art in China (the only kind acceptable) was just as thorough and depressing as it ever was in Soviet Russia or in other recent totalitarian regimes. In China as elsewhere, the same rule holds: art subjected to the imperatives of politics, and overseen by political functionaries, inevitably becomes repetitive political iconography, limited to a specific catechism. The Chinese Communist Party never made any bones about using art as a tool, fitted to propaganda purposes. Mao makes it sound like a clanking camshaft or a piston ring:

> "[Our purpose is] to ensure that literature and art fit well into the whole revolutionary machine as a component part, that they operate as powerful weapons for uniting and educating people."

The militaristic imagery so dear to Marxist-Leninists everywhere is even more pervasive with the Chinese. Daily life is a series of "struggles" in which the dedicated soldiers of the revolution "resolutely shoulder" their "tools" or "weapons" to "storm the enemy citadels" to gain the eventual (and scientifically certain) "victory." Official Chinese art became hortatory posters, filled with symbolic figures representing the soldier, the factory worker, the peasant, the oppressed foreign minorities, the bourgeoisie, the capitalist and so on. Throughout the period, however, there continued to be significant emphasis on the art of calligraphy, which, beautifully written though it was, also

Unique permissiveness of the central government has enabled village painters to develop forceful design, as in *Digging a Well* (below), far different from conventional devices of propaganda paintings.

concentrated on political propaganda. It is all, nevertheless, art brought to heel: stilted, sloganizing, brandishing the "little red book."

In light of this, the Galliera show was all the more surprising. It is exceptional in that there is a new concentration on composition and design, elements of traditional Chinese painting which might strike the uninstructed observer as close to art for art's sake. But all of them reflect an unaffected pleasure in expression, delight in detail and use of bright, optimistic, unshaded colors. The evident happiness of the gouaches gives them a freshness and energy that are totally missing in the executors of official art, however much red paint they splash on their canvases.

"The paintings are like a log of village life," Zao Wou-ki, a Chinese-born French painter who was largely responsible for bringing the show to Paris, told me. "They obviously enjoyed themselves doing them. I like to call it painting without complexes."

Zao first encountered the Hu-hsien pictures when he returned to China to visit his mother in 1973. The art he had heretofore seen around him was thoroughly depressing. "Everything was propaganda," he said. "How sad. Nothing was new. It was completely impersonal."

Everything changed when he visited the Fine Arts Exhibition Hall in Peking, where the gouaches of the Hu-hsien group were drawing endless crowds. There, for the first time, he saw true creation. The paintings displayed no industrial workers or villainous capitalists, only peasants in their surroundings. The public's enthusiasm for the show was in itself an indication of how much the Chinese long for a change from the militant symbolism of the functionary style. Zao determined to find out more about the Hu-hsien group, and to get the show to France.

It all began with the Great Leap Forward, the national act of willpower that was to develop China as a great and self-sufficient power without the traditional, Russian-style preparation of technical know-how and investment in heavy industry. Ideology and daring were to supplant bookish expertise. All over the country peasants and workers hurled themselves into projects for vastly increasing crops and factory production; villagers everywhere built little "steelworks," and local populations volunteered their iron pots and pans and bedsteads to be melted down into "steel," but what trickled out was only molten iron. Mao encouraged his citizens to strive enthusiastically in all sorts of endeavors. Among them was art. "Everyone may participate in artistic creation," he proclaimed in 1958. "Peasants, you may paint!"

The peasants began painting. And not always badly —far from it. Peasant art has existed from time immemorial in China. Over the centuries, even the poorest bought cheap reproductions of kitchen and martial

Author of a book on Chinese labor camps, Prisoner of Mao, *Rudolph Chelminski most recently has written on the ecology of Lake Baikal for* SMITHSONIAN.

In *Night Battle* (below), the full and empty vehicles pass each other. What emerges is the clear power of a controlled composition.

Gathering of bamboo for scaffolding is pretty enough to be wallpaper.

They may be *Exchanging Experiences in Breeding and Management,* which is what this painting is titled, but all the same, in this delicately rhythmed work, it looks like an old-fashioned horse fair.

gods, which they stuck on their front doors on Chinese New Year to keep their houses free of evil spirits. Other New Year's pictures, which they tacked to their walls unframed, showed fat, healthy babies, good harvests and well-built houses—optimistic opposites of their real lives. Moreover, the peasants were skilled at cutting intricate designs out of paper with small, very sharp knives. The bright, decorative cutouts were either sold at fairs or simply used at home to embellish drab and rather grim existences. In calling on the peasantry to actually *paint*, Mao was making a departure, but it was one which already had a prepared base of communal artistic interest.

In the Hsi-an countryside some 600 miles southwest of Peking, the most adroit peasant artists of all were reputed to exist. Zao Wou-ki theorizes that this tradition is probably derived from the fact that Hsi-an was the capital off and on for 21 centuries, and was bound to exert a civilizing and sophisticating influence on its surrounding territories. The agricultural town of Hu-hsien lies only 25 miles from Hsi-an. Asking its people to paint was like inviting ducks to water.

Unhappily for China's and Mao's grand theories, the Great Leap Forward rapidly proved to be a disaster. As of 1960, the Communist leadership began repealing their unrealistic programs and returning to more orthodox ways. It was time to lose illusions: everyone could not do everything after all, even if one had the good luck to be a peasant. As the first, precursory signs of the Cultural Revolution began appearing, Lin Piao, then Mao's deputy and most trusted lieutenant, made it clear that the peasantry was to redouble its efforts in the fields, and stop meddling with unproductive nonsense like painting. All over the country they laid down their brushes—except in Hu-hsien.

"I suppose they felt they were far enough away from Peking that they could pretend they didn't hear the order to stop," suggests Zao. "They just paid no attention and kept right on painting. From year to year they improved their style. They acquired a technique all their own."

If things were as Zao conjectures, this self-willed continuation would have been an act of insubordination for a country where independent initiative is most decidedly unappreciated. In China, when others are doing pushups, one does not do knee bends. The practice of "mutual surveillance" insures that eccentrici-

Unified design sense knits together a panoramic view of a population as densely, methodically

ties are quickly witnessed. After witnessing, one is expected to "assist the government."

What then is the explanation of Hu-hsien's persistent artistry while all others had stopped? It could be that somewhere in the hierarchy someone realized the high quality of their output and permitted them to continue. If the Cultural Revolution did not destroy Buddhist temples or ancient archaeological treasures, it could also tolerate a contemporary art which was conveniently consistent with Mao's definition:

> ". . . life as reflected in works of literature and art can and ought to be on a higher plane, more intense, more concentrated, more typical, nearer the ideal, and therefore more universal than actual everyday life."

Although the Hu-hsien gouaches offer a chronicle of the communes' "actual everyday life," they are idealized to the degree that everything is always clean and shipshape, the machinery running efficiently, the harvests bountiful, the workers well-fed and happy.

Zao's efforts to learn more about the Hu-hsien group bore fruit when he was at length given permission to visit them himself in the town and on the farms. He found them to be a companionable collection of both sexes and all ages, shapes and personalities, but sharing the one common trait of working the soil, either directly in the fields or at second hand in commune offices, shops and warehouses. He retains a particularly vivid memory of his meeting with a tractor driver named Wan. Zao mounted his machine and together they rumbled back through the hot dust to Wan's living quarters. Could this be a painter? Sure enough, when he stopped the tractor in front of a brown, barrackslike building, he announced that he was feeling in top form, and almost immediately set to sketching out the first lines of a picture showing a long field disappearing into the horizon and his workmates on the right and left. In the middle went his jolly green tractor.

"Everything is gouache," Zao explained, "because that's the kind of paint that is most commonly available. The colors are basic, but that's fine with them. Most of them don't even know what they're working with. 'What do you paint on,' I asked them, 'rice paper or ordinary paper?' 'Oh, rice paper, of course,' they told me, but when I looked I could see it was just ordinary paper. What they were concerned with was showing nature and their work. I'll bet the professional painters in Peking all know the difference between rice paper and ordinary paper, but it is the peasants who have the much truer vision. Their colors are bright, sometimes even violent, and the composi-

and determinedly organized as a colony of ants,
and its title, appropriately, is *Unity in the Struggle.*

tions are quite daring. They have a boldness that the propaganda-type painters have lost. Or never had."

An interesting indication of how thoroughly the Maoist order has transformed the Chinese mentality is that never once did Zao encounter an "individualistic" subject in Hu-hsien—no lyrical passages, no portraits of loved ones, of course no nudes and, above all, no nonrepresentational work.

"There are a few revolutionary themes, but mostly it is the collective life—the harvest, the animals, the school, fishing, that sort of thing."

The paintings are naturally subject to discussion and criticism among the peasant work teams and with the several village chiefs, who are invariably party members with a perfect command of dialectics and party ideology. All the painters, even those of the "lowest cultural levels," are perfectly aware that their efforts have primarily a didactic function, to serve the revolution by instructing the people about the good life of the laboring peasant masses.

"Yes, it is a propaganda," says Zao, "but they don't criticize their paintings in that light. What they say when they look at a new picture is: 'this one is closer to the truth.' They want to be sure their art is functional. They never use the words pretty or beautiful. That doesn't concern them."

When in October of 1973 the Chinese government brought the Hu-hsien group's gouaches to the Fine Arts Exhibition Hall in Peking, it was striking evidence that the superregimented days of the Cultural Revolution had given way to a somewhat more realistic and relaxed approach to life. The final vindication of the Hu-hsien group came from the ordinary Pekingese themselves, who voted emphatically with their feet: 2,100,000 of them visited the show. The 179 gouaches were, Zao said, the hit of the season.

Artists in the fields

Only one final step remained to carry the logic of this phenomenon to its conclusion: if the peasants were the most effective painters, then they should be the ones to set the examples for China's large and well-paid corps of professional artists. Many times in the past, Mao had exhorted "literary and art workers" to go into the midst of the workers, peasants and soldiers. Here, then, was a rustic *académie des beaux-arts,* ready and waiting for the slick lads from the city. Late in 1973, the first of the state artists began arriving for their long apprenticeships (up to six months) in the fields and behind the easels. They are still coming, and no end seems to be in sight for the Hu-hsien program. Like advanced basic training for a soldier, it has now become part of required preparation for serving the government as an artist.

"A revolution," Zao calls it, and it is hard to dispute his opinion. Whether the revolution will improve the quality of all official art is difficult to predict. So far, paintings done by professionals who have made their pilgrimage to the province show an effort to flee the sterile, oversymbolized iconography of the old propaganda poster style, some experiments in unacademic perspective and a less literal-minded approach to composition, but overall they do not approach the force of the peasant gouaches.

If nothing else, it will have opened their eyes to other avenues of expression. Most important of all, it will have proved once again one of Mao's oldest and most basic maxims "Before you can be a good teacher, you must learn to be a good student."

Fishermen are obviously enjoying their work here,
but this painting essentially is a gorgeously

decorative celebration of color, motion and form
with evocative references to traditional Chinese art.

By Peggy Thomson

Realistic garb for 1976 versions of Revolution

Here is not just the rattle of musketry during a battle reenactment, but the bubbling of stews, click of needles and bellow of songs

No soldier dandies himself up as British General "Gentleman Johnny" Burgoyne, or takes the part of the Continentals' Horatio "Granny" Gates, or limps off the field shot through the boot like Benedict Arnold, or topples from his mount (there aren't any mounts) like the mortally wounded Briton, Simon Fraser. No turkey call issues from the woods to simulate Daniel Morgan's rallying of his Virginia riflemen. In fact, the firepower at the Breymann redoubt north of Stillwater, New York, where redcoats and revolutionaries are recalling the Battle of Saratoga (1777), is but a modest show of force. Artillery blasts, rifle reports, the floop-floop-floop of volleying muskets have all been nicely calculated to tingle spectators' spines without incurring lawsuits.

Unlike the Sealed Knot Society (SMITHSONIAN, August 1975), the Brigade of the American Revolution—some 1,000 members and 82 fighting units—does not consider itself in the business of reenacting battles. Many of its members, veterans of the North-South Skirmish Association, who refought the Civil War in clamorous spectaculars in the Sixties, count it a blessing that they survived to bear arms again. This time around, they offer tactical demonstrations of 18th-century warfare—one fight fits Brandywine, Yorktown and Saratoga alike—and they devote themselves to re-creating the dress, the drill, the daily camp life of soldiers who served the great Washington or His Britannic Majesty. Theirs is, perhaps, the ultimate American reenactment, after which nothing more need be seen. In the innumerable Revolutionary pageants likely to be staged during the rest of 1976, the costumers, at least, can take cues from the Brigade.

Drummers gather at a Brigade of the American Revolution encampment at New Windsor

"I think we've put some grace into the thing," says the Brigade's elected commander, George Woodbridge, standing at the edge of the field, his hands lightly clasping a cane behind his back. He's a trim, white-stockinged figure dressed in the Corps of Light Infantry's half gaiters, coatee, spare black leather helmet with its plume (a gift of Lafayette), and streamers.

Cantonment. Uniforms and equipment attempt accuracy, from vegetable dyes to bone buttons.

"A historical turn of mind saves us," says the Brigade's lieutenant, William Wigham. Wigham wears the uniform and red moustache (real) of his adopted unit, the Hessian Fusilier Regiment von Dittfurth. His air of ferocity is enhanced by his rough calf-fur *Tornister* (knapsack). His considerable height is exaggerated by his miter helmet, long black 19-button *Gamaschen* (gaiters) and regulation tight-cut coat.

A nasty fight developed some years back in the Brigade when a member, writing in the Brigade's *Dispatch*, argued that authenticity comes high. Handmade shoes, this protester noted, can cost $115. On the other hand, plastic accessories look like leather, synthetics like linen; a low-quality musket nevertheless creates an illusion. But "Shall we ride horseback to Newburgh? Eschew matches? Where will we end it? Must we take ourselves so seriously?"

The answer, in effect, was yes. Woodbridge and Wigham held fast to authenticity. And, though Wigham admits truth is a distant star (the Tryon County

Photographs by Jackie Curtis

At New Windsor Cantonment, militiaman takes a break with metal cup and pipe.

militia drummer is assuredly chewing gum), the question never again arose. The *Dispatch* now single-mindedly pursues the fine points of castramentation (the ordering of camp down to the intervals between tents) and cocked hats (how to tell a Kevenhuller from a fantail). It offers tips on where to buy Russian drilling and fur felt hat blanks, how to make pickering tools and a nine-hole belly box.

All equipment must be documented

Local groups are required to document every item they wear and carry, specific to their chosen date within the war period, and to execute smartly the movements of their adopted unit's drill—whether the Crown Forces' manual of 1764, von Steuben's simplified regulations of 1779, or the Hessian. This seems to suit the members, who are museum people, teachers, construction workers, dentists, students, artists, businessmen—and one U.S. Army sergeant stationed on Staten Island who considers the Brigade his escape to a *rational* military situation. Women are members as well, sharing hardships and discipline as did the camp women who were officially attached to the companies (though they traveled with the baggage). All members are history buffs, all presumably endowed with what was required of their historic counterparts—two opposing teeth for biting open cartridges—and all willing to wear scratchy linen, eat from two-tined forks and school themselves as tailors and craftsmen, some of them even hackling their own flax, fashioning their knives and guns and making no-right-no-left shoes.

And all are willing to submit to systematic scrutiny by their elected inspector, Wigham, the kind of person who has learned to speak German with Hessian inflections, who tends to such details in his own uniform as wrapping the black ribbon of his *Zopf* (braid) around an artillery fuze with a bit of rabbit fur at the tip, and who winces when he hears a piper skirling *Amazing Grace,* which would not have reached Scotland until after the war.

Local units meet regularly—in New England, New Jersey, Pennsylvania, New York—to prepare for weekend encampments that occur every few weeks from spring to winter. A School of the Revolutionary Soldier is held at the New Windsor Cantonment, near Newburgh, New York, where in May 1782, to celebrate the Dauphin's birthday, Washington is said to have danced a gander hop with one of his officers. There the Brigade performs a *feu de joie,* featuring a continuous ripple of gunfire from one end of its line to the other, and a trooping of the colors. It is drummed to table by "Peas upon a Trencher" and the "Roast Beef" call for a banquet which closes with toasts of "George Rejected! Liberty Protected!"

The day-long school offers classes that change at the firing of a cannon—a class on edged weapons, on drum calls that order life in camp and move the troops in battle (with practice in marching the stately Common-Step), on safety (the Brigade requires the soldier's kit to have flashguards to deflect fire up from the priming pan and away from the cheek of the fellow to the right) and hammer-stalls to prevent accidental firing.

A special women's session covers stays (plastic OK, since real whalebone is unavailable), shoes (deerskin moccasins or bare feet acceptable, Capezios and penny loafers not) and overdressing (women in the field would have been a properly grungy lot, wearing petticoats as skirts, pockets underneath, men's shirts, waistcoats and coats).

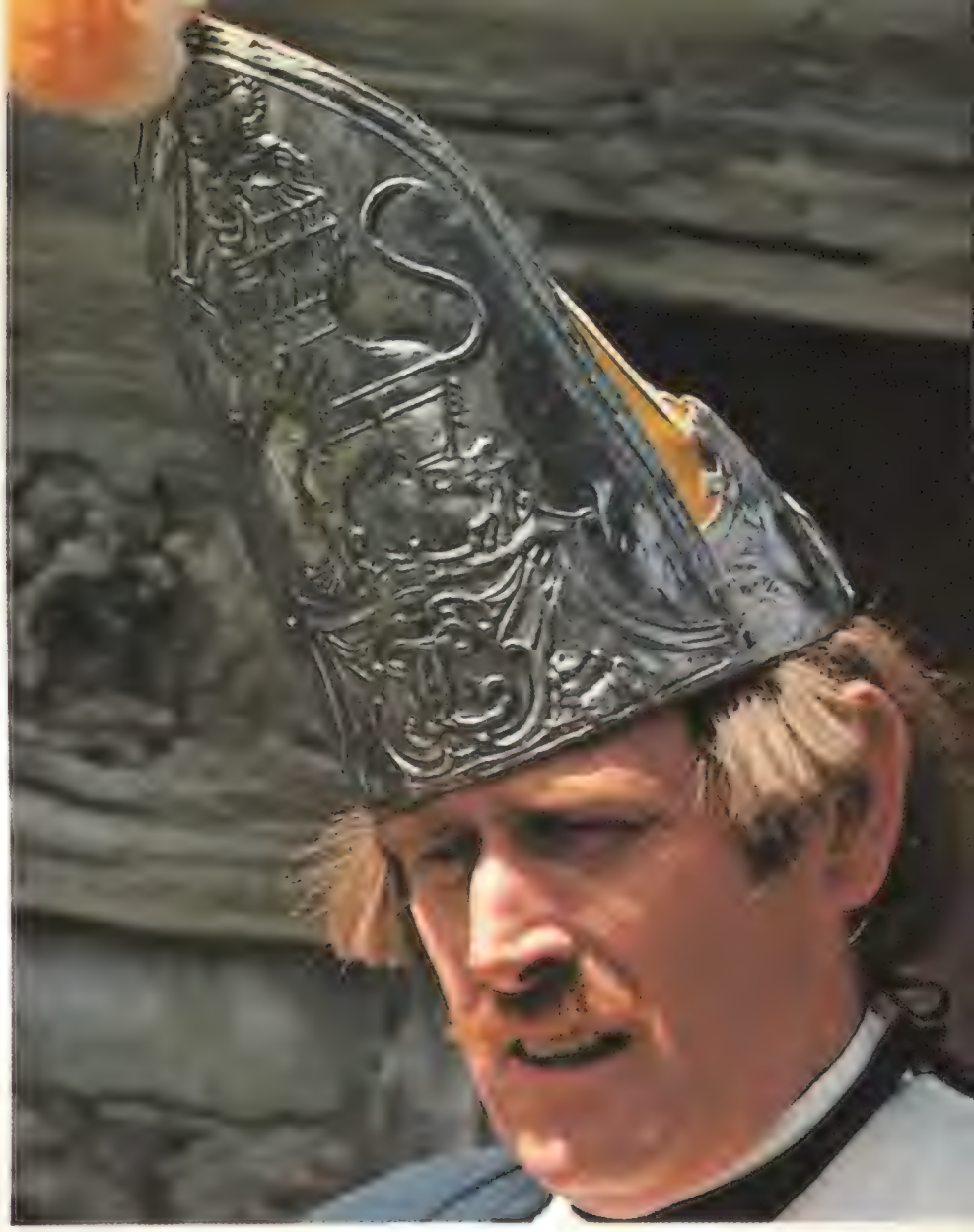
School includes an authenticity contest, in which handmade items backed by written sources qualify members for apprentice, journeyman or master status —items like sledges or boots or goat-fur knapsacks or thread from flax that has been hackled, scutched and spun, or samples of reverse crow's-foot weaving. One woman submitted a generous portion of trifle, from a Boston 1722 recipe, made of pound cake mixed with a syllabub of cream, egg whites and sack, which she whipped with a willow switch.

Troops reach Saratoga, for example, on a weekend. The camp is set up early, spanking white canvas against the green: the American tents in rows, the British facing each other across company streets. A bell tent covers the stacked arms and a single marquee serves as neutral headquarters. Members with vans and orange nylon tents camp out of sight.

Morning mists lift but leave the smoke from half a dozen fires. Camp fills with figures in fringed hunting jackets and fur-trimmed caps, in regimental coats of red, blue, tan and green, the sun making snowy patches of their smallclothes and glinting off polished metal and wood and leather. Children spill wooden fox-and-geese games from their haversacks or spin bull-roarers (made from flattened musket balls) on strings. Soldiers perform camp chores with their coats turned inside out. Knots of them sit companionably stitching buttonholes and mending tents.

The call for noncommissioned officers by the drummers brings a cluster around Woodbridge to hear assignments for wood and water detail (4th New York balks; Butler's Rangers get it instead), announcements (a charter bus trip to Montreal covering the Montgomery march to Quebec), and hearty commendations for diminishing hairiness in the ranks ("We've got rid of so many beards we should troop the faces").

Peggy Thomson is a frequent contributor to SMITHSONIAN. *Her most recent article, appearing last September, dealt with patent drawings.*



Brigade Lieutenant William Wigham wears the miter helmet of a Hessian fusilier regiment.

Commander George Woodbridge, of the Corps of Light Infantry, sports short helmet and plume.

Like their forefathers, brigade troops bend to task of muscling a supply wagon up a wintry

Crafts people set out tools and wares. Rifleman-tinsmith Harry Vogt, New Brunswick machinist, is surrounded by his one-pint cups, barn and watchman lanterns and wooden-stoppered canteens. Next to him there's a leather-aproned pewterer from Staten Island, Roland Cortelyou, member of the Loyalist Billops Corps, as an ancestor, Aaron, was before him.

Debbie Smith bends over a steaming brass pot to dye a length of linen in madder, the poor man's red. The British enlisted man's coat is dark madder; the scarlet of the officer's coat comes from more expensive cochineal, made from insects. Madder on linen comes out purple, a very dark purple when it's done in an iron pot. Debbie Smith has done gray dyeing with birch bark and yellow with barberry. Her freezer at home is filled with pokeberry. She stockpiles sumac, goldenrod and walnuts, and has three markets saving for her their onion skins.

There are makers of soap and stirrers of a huge size stew—the Brigade's supper—and an 18th-century cooking demonstration by Carol Woodbury, high school guidance counselor. Red-faced, her man's shirt and waistcoat, her ticking skirt and large wraparound apron smudged with pot black, she is cracking two dozen eggs into a mound of hot rice, adding handsful of raisins from a crock and sprinklings of cinnamon, ginger and mace. And she's advancing on the Dutch ovens to substitute her puddings for the well-done blueberry grunt. (Well, it's blackberry this time, she tells the public, handing around samples. The grunt is because it goes blump-blump-blump.)

By midday knots of redcoats are picnicking on a knoll overlooking the Balcarres redoubt. The 3rd New Jersey sprawls on a rocky outcropping eating what looks like bologna sandwiches from trenchers. One Billops Corps member is redoing his linen leg wrappings, while a comrade with his foot on a stump is brightening his boot with what ought to be a black ball, but is instead a tin of commercial shoe polish.

A father is filling the cartridge box of his 16-year-old son (they're both of Knowlton's Connecticut Rangers) with powder charges done up in twists of the Hartford *Courant*. Another father, gesturing with his needle hand to his drummer-boy son, complains that he joined up two years ago and has been sewing ever since.

Two Continental Marines, wearing green coats with red facings and small round black hats, fifer Ray Hauley, a physical education teacher, and drummer Bill Frueh, social worker, discuss changes they'll make in their *Yankee Doodle* to conform to Library of Congress findings.

One Hessian to another in passing: "Your tassel, sir, is a disgrace."

With snatches of advice from John Anson, members of the 13th Albany County Militia are practicing "mourn firelocks" with the muzzles of their muskets on the right toe, head bowed over hands on the butt—a gesture for fallen comrades. Anson, eating a pear, cuts a proper 18th-century pear figure, toeing out, balancing his weight on a slender cane—the "typically overdressed" militia officer with clocks on his stock-

hill at Van Cortlandt Manor, N.Y. Uniforms, blankets, sweat, chill and grunts are all authentic.

The day's stew steams fragrantly as the Brigade savors experience of a winter encampment.

ings to match his full-skirted russet coat and green plumes in his military cocked hat.

"We're a motley collection," he says, flicking his stick at the younger men in their wagoner smocks and knit liberty caps, "all from around Saratoga—a ready-made army, just the kind of military unit Britain required us to have in our own defense. We had to supply our own musket, plus either a hanger, tomahawk or bayonet."

Anson's use of "we," identifying with the long-ago unit, is standard for the Brigade, but invites a double take since his accent is British. The "only Limey in the Brigade," he was born in Folkstone, in the county of Kent, in the regimental hospital of the Royal West Kent Regiment, became an American citizen, and now says he likes being on the winning side. He's a restoration specialist for the New York State Museum and Science Services.

Though it's possible to puff out a haversack with a towel, and practical to add allergy pills and car keys, Brigade people make a point of authentic packing. Anson's wife Dorothy carries her family's rations, including a hunk of beef, salted in May, which doesn't smell yet, she says. Ed Dowling, a transportation en-

Next to stacked muskets, two Brigade soldiers tend to the seemingly endless task of sewing.

gineer for the state of New York, carries spoons and trencher of close-grained wood, folding knife, two-tined fork, tinned iron cup, deerskin bag with flannel patches for cleaning his musket, spare flints, some George III coins, pieces of eight, eight-dollar-denomination Continental notes and the pencil and dice he fashioned out of musket balls. Hanging from his belt are a pick and brush for cleaning out the vent and pan of his musket.

The militiaman's lot is not for Steve Tyliszczak, 21, slipcover cutter from Bridgeport, sergeant in the 23rd Regiment of Foot, Royal Welsh Fusiliers, who is adjusting the temple curls of his wig. "We have more glamor, more demanding discipline, more drill, more history. We had the most active service of any royal regiment in America and we smuggled our colors out at Yorktown around the body of an officer. None of our guys is permitted facial hair. We all wear wigs under our bearskin caps. *And* we have double the expense." Tyliszczak, who wears antique spectacles with tiny ovals of glass, has put $700 into equipment, even doing the work himself. The wool has to be 88 threads to the inch, the lace comes from a firm in Yorkshire which supplies the real Fusiliers.

Throughout the weekend, Wigham cruises the encampment, spotting sloppy sewing or indifferently cocked hats or hats with leaves (the turned-up parts of the brim) exceeding the limit. As arbiter of authenticity, he rules on cannon wheels, lapels, capes (they aren't called collars) and interpretations of 18th-century tailoring terms.

His method of "fulling" wool is not universally accepted. He favors beating it with a hammer in a trough filled with water, manure and clay; others say hot and cold baths will do the same if one soaking is in a vat of urine. The object either way is to come up with a dense, non-raveling weave that permits edges to be finished raw, without hemming. Such edges are prized.

New units get a strenuous going over—for instance, Alexander Hamilton's Battery put two years into making their buckskin breeches, spoons and the gun carriage for their six-pounder. Wigham calls their work flawless. Four boys seeking applicant status as Armand's Legion and admitting they've assembled the gear in three months, are told their uniforms show it. But their caps are fine and so are the shirts, of good rough linen off surplus store mattress covers. The muskets pass—one Japanese, one Italian. A moustache is marginal ("but I'm a German deserter"). One cartridge box looks like a reject from a handbag counter. Buttons are dingy. Buckle thorns rough. Boy number four has a wad of excess cloth at the nape of his neck, more wads at his ankles and, although it's authentic for the seat of the breeches to be baggy, a baggy crotch, says Wigham, flipping up the hunting shirt skirt, is not. "You will have to redo your fall."

By Saturday night, one performance down and one to go, figures with lanterns stand in company streets smoking pipes—one cluster from the 3rd New Jersey, three fellows from the 1st New York, regimental coats buttoned against the cold. They're swapping information on what they pay for black powder by the pound and tales of remembered miseries—the 104 degrees in Philadelphia, the wind and rains at Oswego.

Others sing by the fire, harmonizing over the minor strains of "Over the Hills and Far Away" and following it with "Cinnamon and ginger, nutmeg and cloves/That's what gives me my jolly red nose."

Next day, a narrator interprets moves over a loudspeaker as the Brigade, under a pile-up of luminous clouds, performs its Sunday afternoon shoot-out. "The riflemen are moving out now on the flanks. There goes the three-pounder. The American line is firing a volley. The drums are giving the order. You can spot the NCOs to the right of the platoons signaling with their halberds. And . . . it's a bayonet assault. . . ."

The narrator explains that the Crown Forces and Germans present are not the same units that fought at Saratoga, and that the Tryon County and Albany County militias, which ought to have considered Saratoga *their* day, are instead fighting with the British "to even up the sides." In fact, the events at Saratoga turned the tide of war in America's favor. Burgoyne surrendered and he even toasted General Washington in New England rum, and Gates returned the compliment to the King. And now the Brigade raises its three cheers—to each, once again.

Smoke of the gun powder wreathes the Hessians of Fusilier Regiment von Dittfurth at New Windsor.

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Growing in flat T-flasks at left and right are HeLa cells in a culture collection at Rockville, Maryland.

Colored fluids in the background are nutrients; the test tubes hold bacterial testing media.

By Laurence E. Karp

The immortality of a cancer victim dead since 1951

Survival of cells from a biopsy 25 years ago in labs around the world has resulted in bad as well as good news for researchers

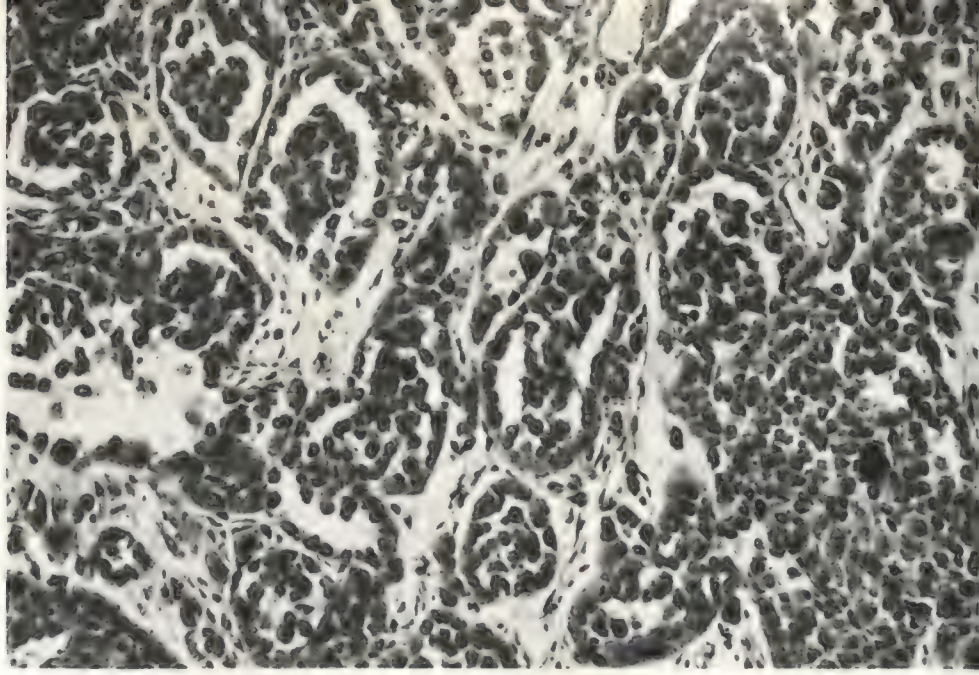
A woman who died in Baltimore 25 years ago may be as close to actual immortality as anybody is likely to come. Although she is dead and her body buried, cells from her cervix live on in laboratories around the world. Her name, contracted, appears frequently in scientific journals as well as medical folklore; her enzymatic and chromosomal signatures are the standards by which others are judged.

In February of 1951, a young black woman came to the gynecology clinic at Baltimore's Johns Hopkins Hospital. Her problem was frequent and irregular vaginal bleeding. Upon examining her, the doctors found a soft, bleeding area on the cervix; a biopsy revealed it to be cancerous. A second biopsy specimen was given to Dr. George Gey (p. 56).

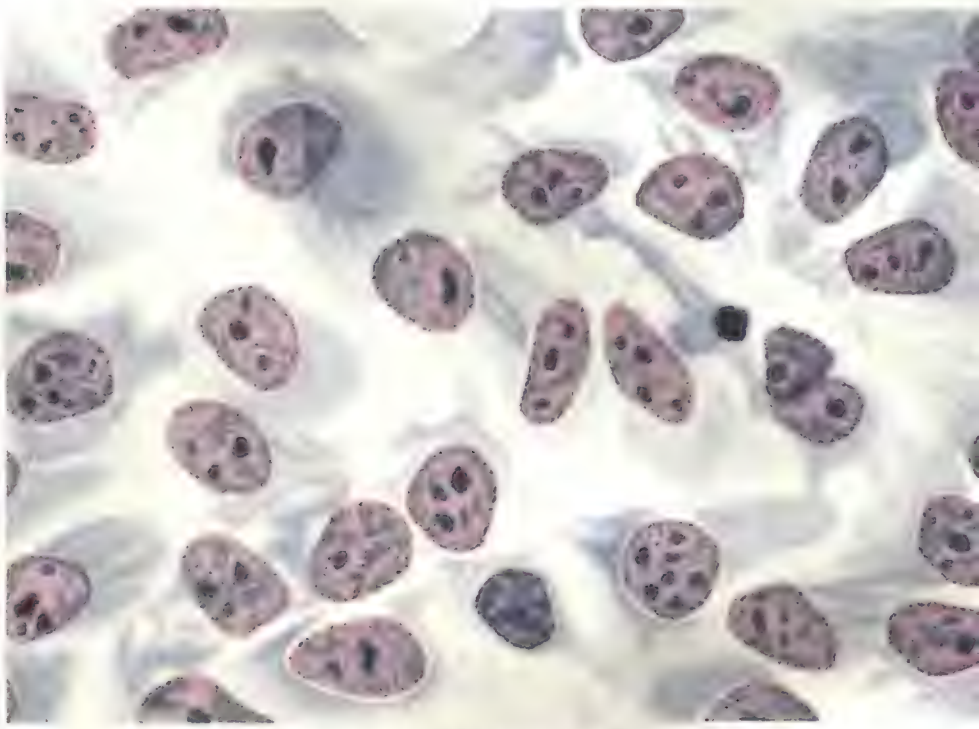
At that time, Dr. Gey was at the peak of his career at Johns Hopkins. His specialty was tissue culture: growing cells in incubated test tubes which were constantly rotated to maintain a flow of nutrients to the cells. Dr. Gey had succeeded in cultivating many different kinds of human cells. But he and other scientists had found it difficult to coax human cancer cells to take up residence in the laboratory.

In 1951 the culture of cells from human cancers was a high-priority item. Cancerous cells living under controlled conditions might yield important knowledge about both the causes of malignant tumors and the problems of cancer therapy. So Dr. Gey had tried many times to cultivate malignant biopsy specimens in his roller tubes, but with little success.

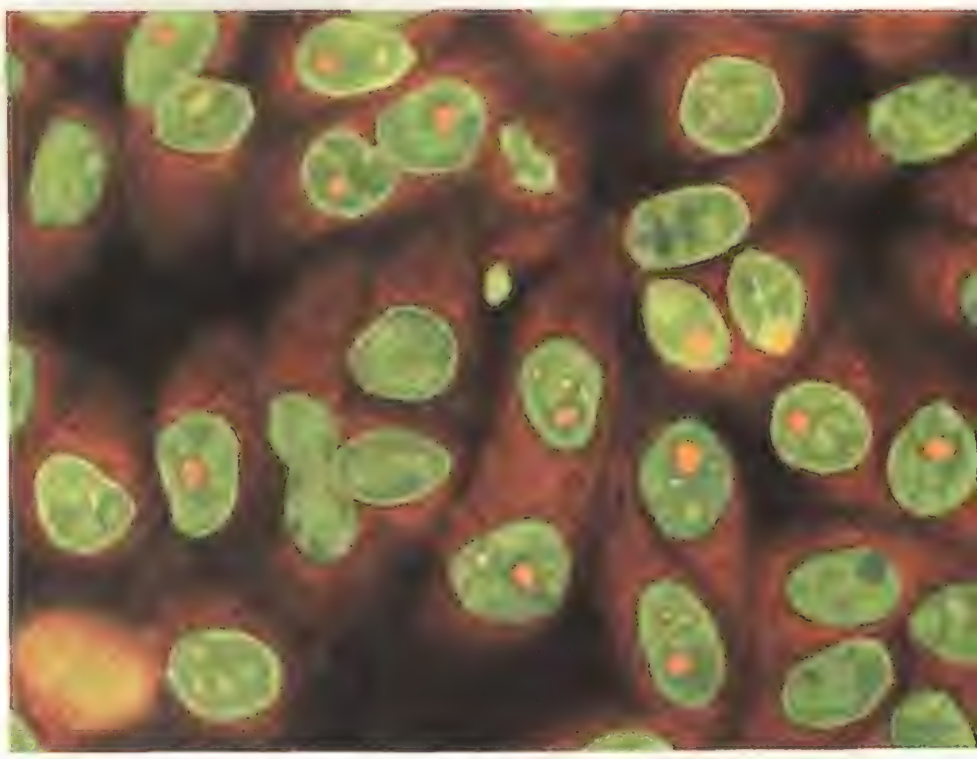
Henrietta Lacks, Helen Lane or Helen Larson is better known as HeLa, acronym for her cells.



This is a microscopic view of the original biopsy from which HeLa cells were first cultured 25 years ago.



In these paintings of stained HeLa cells, blue areas are cytoplasm while round objects are cell nuclei.



With a different stain, the DNA in the nuclei glows bright green under ultraviolet light.

On that particular winter day, however, Dr. Gey's luck changed. It soon became apparent that colonies of cells from the biopsy were taking hold on the sides of the tubes. The cells continued to proliferate, and before long Dr. Gey was able to establish subcultures: transplants of a few original cells into new tubes. Again, the tumor cells grew with spectacular success.

Dr. Gey named his strain of cultured cancer cells HeLa, an acronym constructed from the first two letters of the patient's first and last names. HeLa continued to proliferate wildly in the culture tubes. Each cell divided about once a day; and soon there were enough progeny to ship samples of the tumor strain to other investigators, first throughout the country, and then worldwide. The earlier recipients, in turn, sent cells to other facilities, so that the spread of HeLa through the international scientific community was extraordinarily rapid.

In the early 1950s cell culture was entering a critical period. New culture media and techniques would cause cell culture to go in ten years from an esoteric scientific semiplaything to an extremely significant, widely employed investigative tool. The hardy, rapidly growing HeLa cell was ideal for testing newly developed culture techniques or new nutrient media. Even today, HeLa is the standard reference cell in many laboratories; without it, current research would be years behind its present state.

But the laboratory life of HeLa has been much more varied and colorful than the foregoing might suggest. George Gey's original hope had been to learn more about the behavior of cancer cells, and in this respect HeLa has certainly been satisfactory. The cells have been the subjects of innumerable studies which have yielded important data concerning the anatomy, physiology, metabolism and growth characteristics of cancer. In addition, HeLa cells have been used in a

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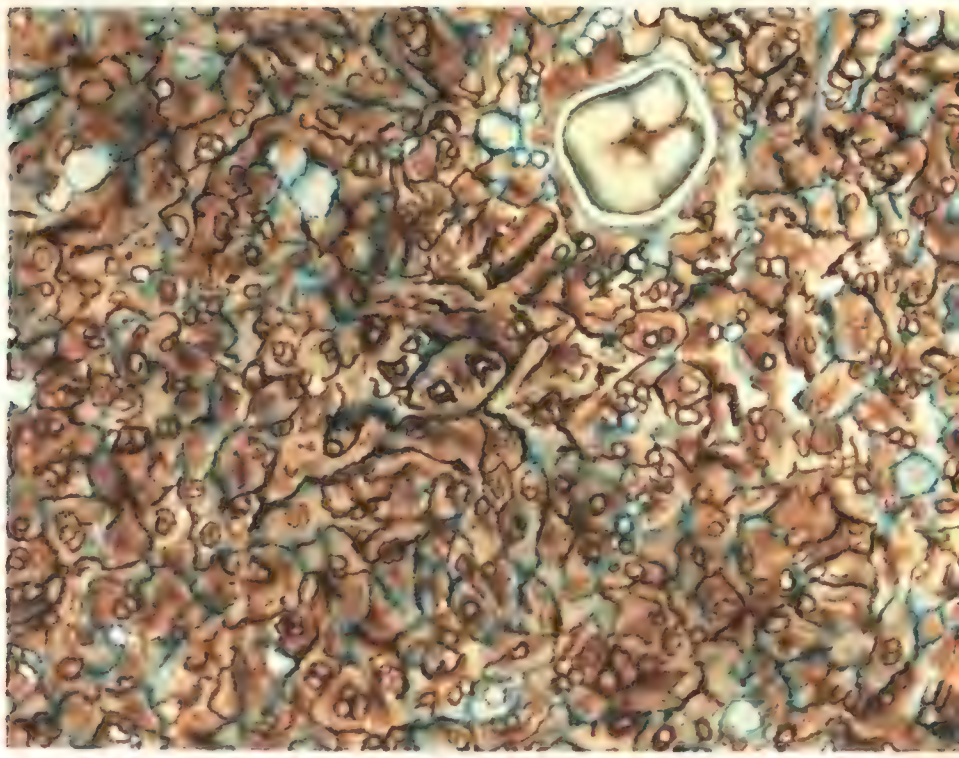


In this painting living HeLa cells are magnified 200 times. The large white object is an "optical artifact."

wide variety of striking experiments which have not been directly concerned with cancer research.

In one recent study, for example, whole mouse-cell nuclei were introduced into HeLa cells; the HeLa cell cytoplasm then activated the mouse nuclei, so that characteristic mouse proteins were produced by the composite cells. Many will recognize this experiment as similar to cloning, the process by which a nucleus from a cell of a frog may, upon introduction into a frog egg, direct the egg to develop into a "carbon copy" of the nuclear donor. Few, if any, scientists are interested in producing Xeroxed frogs (or humans, for that matter, despite the recent profusion of sensational newspaper and magazine articles); however, these techniques will also very likely improve our ability to deal with genetic diseases.

HeLa cells have been exposed to environmental pollutants, drugs and chemicals, and then checked for mutations or growth disturbances. Similarly, HeLa cells have been cultured in the presence of certain plastics, and the degree of growth inhibition (and therefore the toxicity) ascertained. The survival of irradiated HeLa cells has been useful in assessing the hazards of x rays. Perhaps most important, pathogenic microorganisms have been permitted to do their dirty work on HeLa cells, so that cellular invasion by infectious agents might be better understood.

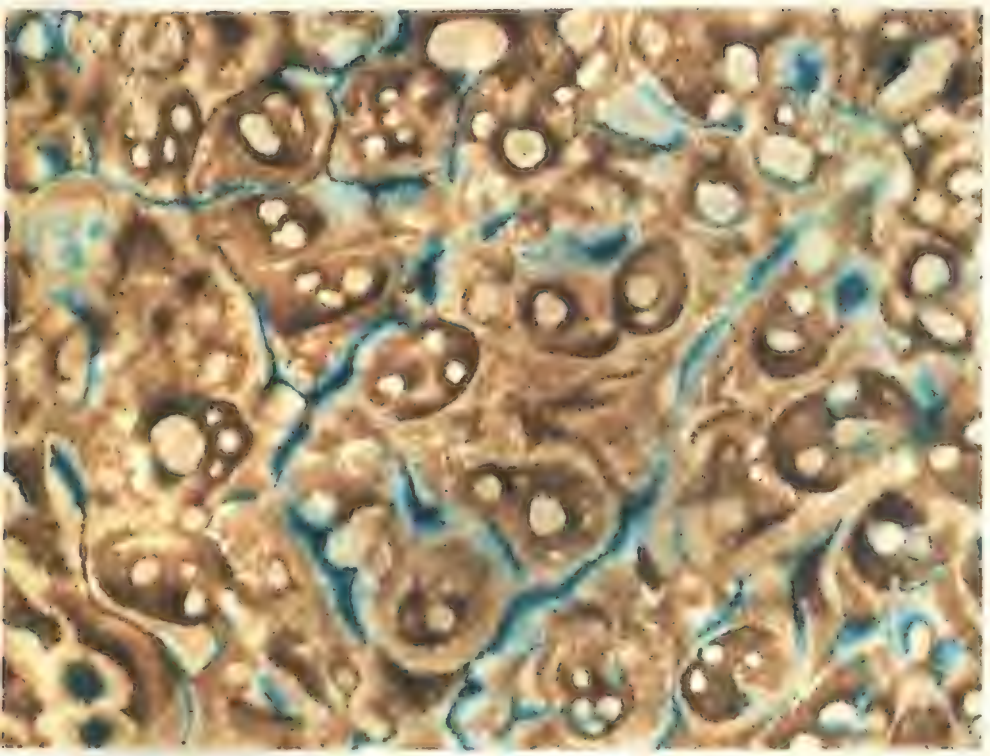
Unfortunately, however, the HeLa cell has not been an unalloyed blessing to cell biologists. Its aggressive growth characteristics, usually so advantageous, have also been responsible for grief in the laboratory.

Most cultured cells have very similar microscopical appearances, and during the late 1950s it became disturbingly clear that many cell lines thought to be of one particular origin were in reality another. Numerous labs uncovered examples of interspecific contamination; a strain of cells reputedly from monkey kidney would be discovered to be actually mouse cells, for example. Several lines of evidence led to these unpleasant discoveries. For one thing, the total number of chromosomes, as well as their individual sizes and shapes, are characteristic for each species. In addition, the sensitivity to infection by specific viruses (such as the polio virus) is very different in cells derived from different animals.

All this confusion was a consequence of the state of the art of tissue culture and what would now be recognized as sloppy technique. Monkey cells sometimes were placed into culture with instruments that had been used immediately beforehand to handle mouse cells; the more vigorous mouse cells would then take over and overgrow the culture. Alternatively, contaminated instruments might have been introduced into bottles of culture medium which would then be used indiscriminately for all the cultures in the laboratory. Even airborne contamination could occur.

By 1957 the problem had been recognized, and stringent precautions were being taken to minimize contamination of incubated cells. Furthermore, periodic monitoring of cultures was instituted to detect any occasional slipup.

But many in this business still were not satisfied. True, interspecific contamination was no longer a major concern, but what of intraspecific contamination? None of the above-mentioned techniques could be used to determine whether a culture of human cells had been overgrown by a contaminant also of human origin. It did not ease minds, either, to know that practically all cultured human cell lines had been es-



The same cells are here magnified 790 times. To naked eye, the sheet of cells appears as a thin white film.

tablished between 1952 and 1957. Coincident with the widespread establishment of anticontamination controls, it suddenly had become considerably more difficult to culture new strains of human cells. If they were so hard to grow in the absence of contamination, what in fact had been growing before?

The theoretical concern became a reality in 1966, when Dr. Stanley Gartler (p.56) of the University of Washington found evidence strongly suggesting that 18 established cell lines thought to be of independent human origin were all, in reality, HeLa cells. Dr. Gartler's conclusions were based on the use of genetic markers: enzyme polymorphisms.

Polymorphisms are slight structural differences in body proteins that do not interfere with normal function. Perhaps the best-known human polymorphism is that of the major red-blood cell proteins, which in some persons are of Type A, while other individuals have Type B, Type O or a combination.

In unmasking HeLa, Dr. Gartler relied primarily on two enzymes involved in sugar metabolism known as G6PD (glucose-6-phosphate dehydrogenase) and PGM (phosphoglucomutase). The polymorphic forms of these two enzymes can be separated and identified by exposure to electric fields.

All Caucasians have the form of G6PD known as Type B, but 30 percent of blacks have Type A. Some of the cell lines tested by Dr. Gartler were supposed to have come from white patients, but he found that the G6PD from all 18 lines was Type A. The cells had to be from black patients.

Supporting evidence comes from the PGM. About 35 percent of the population has Type 2 or a mixture of types one and two; all 18 cell lines were Type 1, an improbable result if they were all of different origin.

Dr. Gartler calculated that if the cell lines were indeed of independent origin, even assuming they all had originated from blacks, the statistical chance that every one would be G6PD-A and PGM-1 was only six out of a quadrillion. He concluded that the most reasonable explanation was that all the cell lines had actually arisen by HeLa contamination.

Other research confirmed these suspicions. Most recently, in 1974, Dr. Walter Nelson-Rees and his associates at the University of California in Oakland reported on six cell lines which had been sent to American scientists by Russian counterparts. Supposedly, all six lines had arisen from either human embryonic cells or human tumor cells. Nelson-Rees' group studied so-called marker chromosomes in the cells.

Normal human cells contain 46 chromosomes of specific sizes and shapes. Tumor cells (such as HeLa), however, usually possess additional chromosomes, many of which are of bizarre, singular configuration. Therefore these chromosomes are called "markers," because they identify their particular tumors. Using recently developed techniques for staining chromosomes, the Oakland team was able to determine that all six Russian cell lines contained markers identical to HeLa cell markers, a wildly improbable chance occurrence, and reasonably explicable only by the assumption that all the cell lines had in fact arisen by HeLa contamination.

These findings had tremendous significance. Considerable prior cell research was invalidated, because it had been based upon false assumptions as to the origins of the cellular subjects. To prevent similar disasters, tissue-culture specialists have been compelled to undertake periodic cell screening in their laboratories. Many facilities that specialize in cells particularly difficult to cultivate now take pains to ascertain that no HeLa cells ever enter their culture rooms.

But what of HeLa the patient, who did not live to witness her contribution to medical science and who probably went to her grave ignorant that her tumor was very much alive in George Gey's laboratory? Invariably, her story is told to medical students during their cell biology lectures. "Helen Lane has achieved immortality, both figuratively and literally," intoned my professor. At the time, I thought the comment was a little hyperbolic, but over the years as I heard it repeated again and again, I came to realize that Helen Lane had become an item of true medical folklore.

Dr. Karp specializes in reproductive genetics at UCLA-Harbor General Hospital, where he is associate professor of obstetrics and gynecology.

In 1971, however, I read a poem by Nancy L. Caroline in the journal *Perspectives in Biology and Medicine* which showed the woman's name, at least, was not quite certain. Its title was "To Helen Larson"; it described "the Law of spawn and die" and how Helen

Quite untied the knot of sex and death
Her breath ceased
In the tomb,
Unmindful that her womb persisted separately.

The poem concluded:

To multiply is to divide,
Spawning immortality.

"Now was her name Helen Larson or was it Helen Lane?" I wondered, and I thought how ironic was the question itself.

Then, in the December 1971 issue of *Obstetrics and Gynecology*, there appeared an article about George Gey and HeLa. It was written by four doctors, including Howard Jones, the gynecologist who had been in charge of the patient's clinical problems, and it included a photograph of the woman. The caption under the picture read: "Henrietta Lacks (HeLa)."

Although the article certainly was authoritative, it had the usual effect of a fact upon a well-established myth. In 1974, when Dr. Nelson-Rees published his findings, the problem caught the attention of the popular press. "Cell mystery—Helen Lane leaves mark" read a headline in the *Seattle Times* on June 20, 1974. Beneath the banner was a reprint from the *Manchester Guardian* describing how Nelson-Rees had determined that the six lines of Russian cells had in reality "derived from Helen Lane's tumor long ago."

So it has gone, and so it probably will continue. As HeLa the tumor completes its 25th year in culture, HeLa the patient, who has had immortality thrust upon her, continues to wander through medical history as a poignant modern-day Ozymandias.

Dr. George Gey, above, died in 1970, but the cancer cells he cultured in 1951 thrive to this day. Dr. Stanley Gartler, below, provided evidence that HeLa cells had contaminated other human cultures.

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A sweeping view of the environment entrusted to Man

The Field Museum describes its current major exhibition as a 'most disturbing' inquiry into our use and abuse of Earth

What was this world like before the hand and machines of Man ever touched it? What may it be like before, finally, he is through? And what will be the consequences for him if he does not choose wisely among the options that are still open to him as the dominant species on Earth? The current Bicentennial exhibition at Chicago's Field Museum of Natural History, "Man in His Environment," seeks not only to inform but also to make the visitor "consider the implications for the Earth's future." This could be, says the Field, "the most significant—and most disturbing—exhibition" ever at the museum.

Disturbing because what it shows is utterly unspoiled, the most spectacular display in the exhibition is a 48-foot-long, 8-foot-high mural depicting six of the Western Hemisphere's great biomes or natural habitats of plants and animals as they might have looked before humans ever entered them. The sextuple view was drawn in pen and ink and then was enlarged photographically in stages to fill a curved wall. A traveling version of "Man in His Environment" will be circulated nationally by the Smithsonian Institution Traveling Exhibition Service.

For complete mural, fold out following pages

© 1975 Field Museum of Natural History

Tundra

In drawing the six biomes, the artist was free to choose from among all the myriad species that inhabit them, and to render her own impressions. In this scene from the inland Arctic (above) the weather is calm, the visibility is unlimited. Musk-oxen stand immobile in the background, the adults facing outward to protect their young. A noise has alerted the herd of caribou, the only deer species in which both sexes bear antlers. They have interrupted their browsing on the carpet of reindeer moss (a lichen) to peer around for signs of danger. A fat willow

Deciduous forest

ptarmigan walks across a patch of snow at left, a snowy owl is alighting on a rock at right, near a pair of shed antlers, and at bottom a family of brown lemmings scampers amid a ground-hugging 'forest' of dwarf willow and Labrador tea.

In the glade in a deciduous forest, the red fox at lower center has caught a rodent for her two cubs—but the squirrels playing around the rotted log seem unconcerned. A bluejay perches on the snag above them. In the woodland shade, wild turkeys at left and three white-tailed deer at center take advantage of the thick cover. Trillium and violets, bloodroot and ferns cover the

Grassland

ground, and both the dogwoods and sugar maple trees are fully leafed out for summer. The grassland scene looks deceptively idyllic; a prairie is highly vulnerable ecologically and its balance easily upset by cultivation or by animal slaughter. Here two hawks wheel in the sky above a herd of bison. In the middle distance pronghorn are feeding on the bunch grass. At right, near the busy prairie dogs and their row of burrows—flanked by lush growths of shooting star, Indian grass, clumps of yarrow and prairie fringed-orchid—struts a pair of plump prairie chickens. At lower right a meadowlark brings food to her young. The

Desert

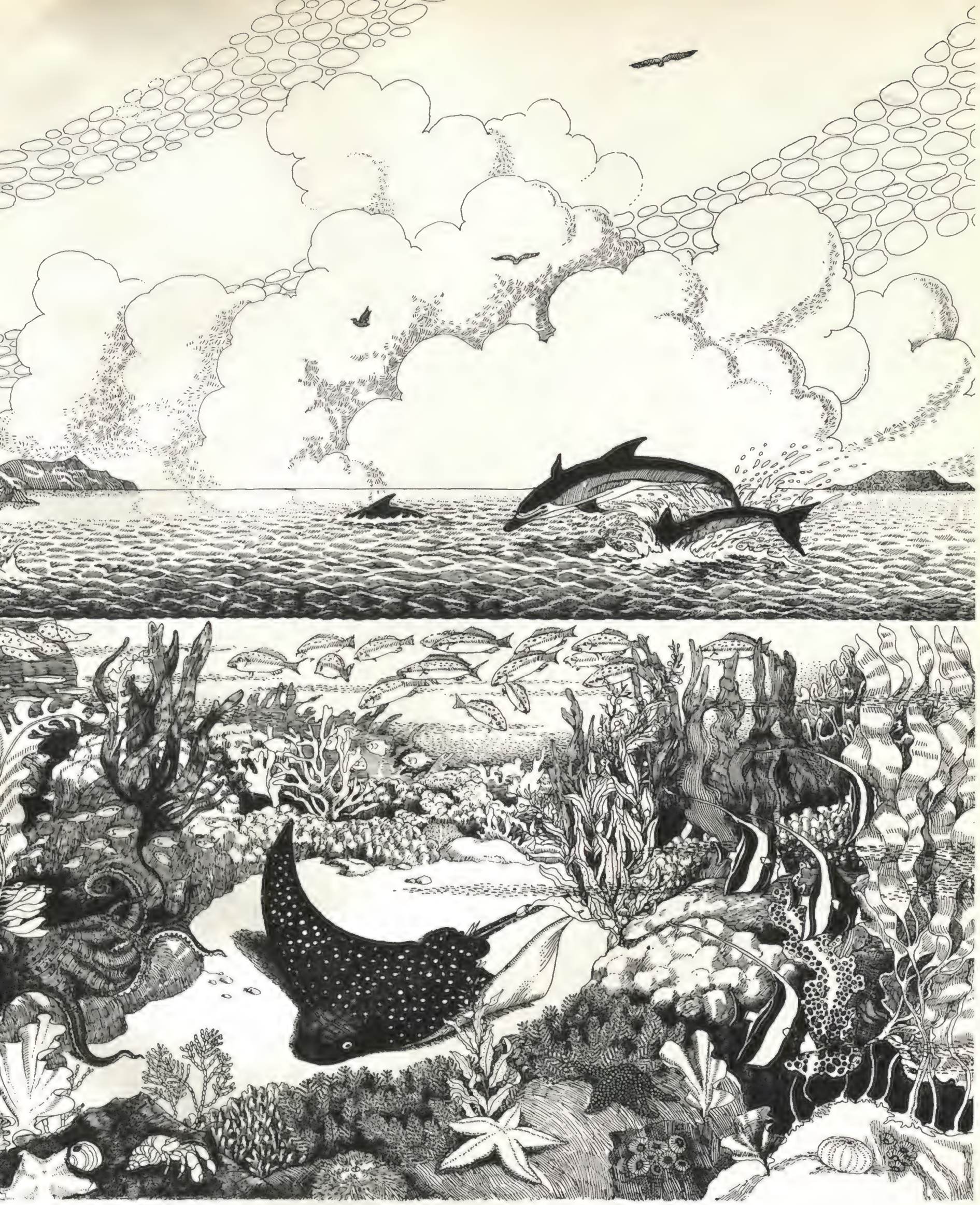
picture is less comforting today: some populations of prairie dogs, chickens and pronghorn are endangered. Bison were saved from extinction only by careful herd management—the North American population is now about 30,000.

Now the scene shifts to the desert, a biome that is arid but certainly not lifeless. There, to the left of a spiky ocotillo, stands a roadrunner that has just dispatched a snake. Kangaroo rats—so-called because they use their hind legs to propel themselves hippity-hop—jump around in the foreground. Lurking near them in a little rock hollow is a

Jungle

scorpion; another one is poised on a rock just to the right of it, under a prickly pear cactus growing at the foot of a tall saguaro. An antelope jack rabbit squats at the left of the saguaro trunk. A sidewinder rattlesnake, drawn somewhat out of scale (they are rarely more than two feet long), squiggles across the sand, leaving its telltale lateral body prints. Just beyond it are several opulent yucca plants and agave (also called century plant). The mural moves on to the tropical rain forest, where a lordly jaguar (today an endangered species) crouches, waiting for prey to

pass below. The tree is host to a cornucopia of life: the orchids below the cat and the bizarrely striped bromeliads growing on the branches are epiphytes, taking nourishment not from the tree but from the air. A Morpho butterfly clings to the main trunk; in back of it a boa constrictor wraps another tree in multiple embrace, while on higher branches two dignified Amazon parrots perch and a comical spider monkey dangles by arms, legs and tail. The lianas coiled around the branch at right are the kind of vine on which Tarzan swung, but they can also garrote the unwary pedestrian. The final part of the mural goes to sea,



showing an oceanic environment where many more life forms proliferate below the surface than above it. A brown pelican (now endangered) stands on a rock at left, and dolphin disport themselves at right. Below them the waters and the sea floor are teeming: a school of yellowtail snappers cruises just below the waves, an octopus undulates outside its home in a crevice, and a spotted eagle ray snoozes on the bottom sands. Ribbons of kelp wave in the current, and below are fluted bouquets of sea lettuce, a hermit crab, starfish, a cluster of barnacles and a pumpkin-shaped sea urchin.

To order copies of the drawing, printed on one side only, see p. 114.

In a sideshow sequence in *Parade*, hands form designs on the tattooed man: butterfly and fire adorn legs; pumping heart is below large open mouth. Hands of other actors depict phrase, "New Deaf Dominion."

By Jean Stratton

The 'eye-music' of deaf actors fills stage eloquently

In its newest production, Parade, *National Theatre of the Deaf combines sign language, mime and humor to create unique drama*

Tension filled the crowded auditorium. Houselights dimmed, voices were stilled, and the audience readied itself for what was to follow. It was one of those tantalizing moments that occur just before any live performance, whether it be musical comedy, drama, opera, dance, even the circus. But this audience was about to experience a new type of theater, a very special blend of words and movement unlike any other seen before. The National Theatre of the Deaf was about to present its new production, *Parade* (the subject of the photographs on these pages), and any skepticism in the audience regarding deaf actors would soon dissolve in enthusiasm for the entertainment's swirl of color and movement and its panache.

It is also one of the rare occasions when the subject matter of an NTD production deals with deafness itself. In *Parade,* a professor recalls his own graduation from a high school of deaf students and remembers a march to Washington in which he participated. He tells the audience of the hopes and expectations the marchers had for their "New Deaf Dominion," a place where they would be free from the condescension and "special" treatment to which the deaf are frequently subjected, a place where they could be individuals and live as they wished and develop their own ideas.

As the professor reminisces, time suddenly freezes and we see the parade itself unfold—a montage of marches, rallies, speeches, demonstrations, dances, all with accompanying banners and floats, colorful costumes, and punctuated with stinging commentary on the state of the world, both hearing and deaf. It is a parade into the past, too, as farcical sketches range from the Old West to Columbus' discoveries (see cover) to Biblical episodes, viewed from the vantage point of the deaf. More recent times are represented by a variety of comic vignettes and events—a carnival of the deaf filled with weird and wonderful characters: "As the Hand Turns," a special deaf soap opera; "The Adventures of Mr. Silence," the deaf version of Superman; and "Cinderella and the Magic Glove," a slapstick rendition of the fairy tale.

Throughout, emphasis is on the importance of sight to the deaf—for example, their visual rather than verbal language. The "star" of many sketches is the hand.

Indeed, central to any NTD production is the use of sign-mime, a combination of sign language and mime which is really a theatrical extension of the manual language by which many deaf people communicate. However, the spoken word is another element of these productions. Usually, three or four hearing speakers or narrators are integrated totally into the action of the play and speak the lines at the same time they are signed by the other actors. This alliance of speech and sign gives the NTD a unique place in theater history. The words increase the understanding of the sign (85 percent of the audiences are hearing and therefore do not know sign language), while the sign enhances the meaning of the words.

Help from The Miracle Worker

Parade is the NTD's 19th major production. Established in 1967 under the auspices of the Eugene O'Neill Memorial Theater Center, the company of deaf actors, numbering anywhere from 11 to 16, has given more than 1,500 performances. It has had 18 tours across the United States (including two Broadway runs and missing only four states), eight tours of Europe, Asia and Australia, and also visits to Israel and Canada. Critical acclaim has been nearly unanimous. Audiences increase every year, and the NTD has grown into one of the most consistently busy acting companies in the United States. As David Hays, award-winning Broadway scenic designer and now managing director of the NTD, says, "When funds are being curtailed elsewhere due to the economy, we're increasing our bookings by ten percent each year."

This is a far cry from what existed just nine years ago. Although amateur deaf acting companies abounded, there was no professional company. In fact, the thought of one would have seemed strange to many people. With the advent of *The Miracle Worker* in 1958, the play dealing with the life and ultimately successful struggle of Helen Keller to overcome both blindness and deafness, the idea of deaf theater took

Photographs by Bill Ray

The universe . . .

of the deaf . . .

wants [you] . . .

In a speech by Linda Bove, one sees that sign language, like all others, depends on context and flow. At far left, sign for universe could also be upswing of sign for "name." Third from left, sign is actually for "wish."

firm hold. In 1964 the Eugene O'Neill Memorial Theater Center was established in Waterford, Connecticut, to promote live theater in various ways.

When David Hays helped establish the O'Neill Center in 1964, he proposed the idea of a national deaf theater and the Center agreed to act as a sponsor. The Rehabilitation Services Administration of the U.S. Department of Health, Education and Welfare awarded the NTD a $140,000 grant for training, rehearsal and preparation for tours. On tour the company had to earn its own way. Contributions have been received from foundations and private donors, and the government has continued to fund the theater, seeing it as a means of creating pride among the deaf and of correcting public misconceptions. David Hays confirms what the NTD's backers have hoped. He observes that it "is the most successful social theater in America. In our plays, the social aspect is built in. The constant exposure of NTD has led to a revolution in the deaf world —their increased pride, self-image, demands."

For even today, the deaf are sometimes regarded as rather strange. The Old Testament found it necessary to warn against mistreatment: "Thou shalt not curse the deaf." The terms deaf-mute and deaf-and-dumb lead some people to believe deafness always includes an inability to speak. One who cannot hear has difficulty speaking clearly because he cannot hear the sounds he is attempting to form, but there is nothing wrong with a deaf person's vocal cords.

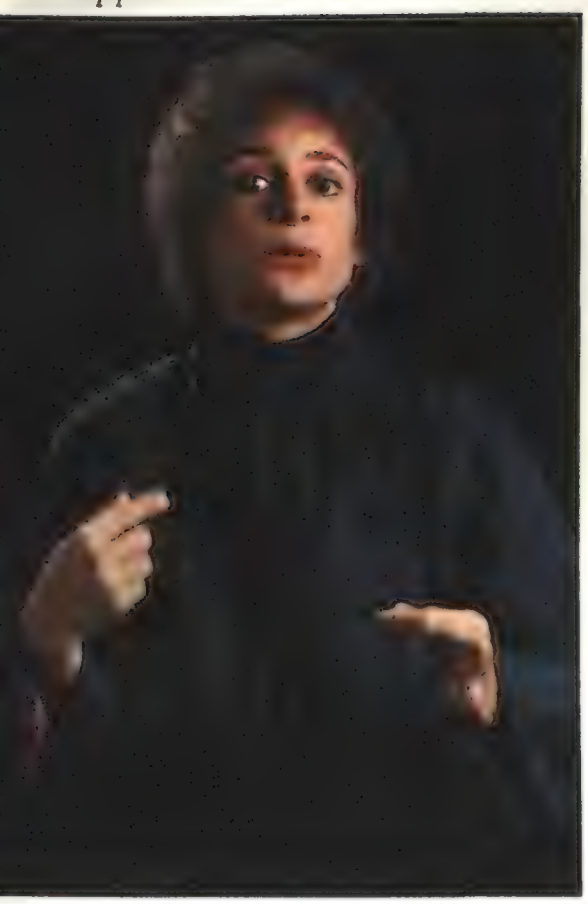
In the 18th century, in an effort to bring religious education to young deaf people who had been denied any education at all, a French priest, the Abbé Charles Michel de l'Eppé, constructed and codified a sign language based on the signs and gestures by which his pupils communicated with one another. It has been described as "a visual equivalent of spoken language . . . a true language, independent of speech and hearing, dependent instead on the hand and eye." An expanded form of this hand language is used today in the United States by many deaf persons to communicate with each other, and in an extended form to suit the purposes of the theater.

Once the NTD got under way, its artistic and theatrical goals became paramount. The staff set about gathering the best deaf actors they could find, and one of the first recruited was Bernard Bragg, already a professional. After graduating in 1952 from Gallaudet College in Washington, D.C. (the only accredited liberal arts college for the deaf), Bragg studied mime with Marcel Marceau in Paris and later toured the United States, performing in colleges and nightclubs and appearing in a television series, *The Quiet Man.* Tall, agile and good-looking, Bragg (p. 71) has been called "the man with the golden voice in his hands."

His versatility is given a splendid showcase in *Parade.* Enacting the pivotal role of the professor, whose reminiscences of the parade he embarked upon

Formerly a reporter with Life *magazine, Jean Stratton is now a free-lance writer based in New York.*

to support . . .



[their] silent . . .

rally.

At far right, she is finger-spelling and is seen between letters. A literal translation sounds awkward but, in colloquial English, she would be saying something like the sequence of words above these pictures.

as a young man form the basis of the play, Bragg also assumes other characterizations during the production. Moving easily from the role of an Indian in "How the West Was Won" to the husband of Madame Rose, the great deaf fortune-teller in "The Astounding Astonishing Carnival of the Deaf," he tops it off with a rousingly provocative "hand" striptease, concluding the routine with the removal of an imaginary glove. And what is undoubtedly one of the play's most affecting moments occurs when he sensitively describes his hopes and dreams for the "New Deaf Dominion, the city built by silent hands."

In 1967 the theater was ready for its first tour, its program a varied repertoire of poetry and short plays. Among them were adaptations of William Saroyan's *My Heart's in the Highlands* and Puccini's opera *Gianni Schicchi*; "Tyger! Tyger!" based on William Blake's *Songs of Experience*; and *The Tale of Kasane*, a Japanese Kabuki play. Audience reaction was almost completely favorable. Some playgoers confused the theater *of* the deaf with a theater *for* the deaf and were thus sometimes dragged to the theater, reluctantly but dutifully supporting what they thought to be a worthy cause. Occasionally, hints of condescension cropped up—the attitude of "Aren't they wonderful, in spite of their handicap!" But in most cases reaction was one of surprise and then delight with the NTD's innovative and vibrant performances.

Professional criticism, too, has been substantially approving, although on occasion the question is raised whether the sign becomes simply an illustration for the spoken word and unable to stand on its own merits. One critic referred to the social aspect of the NTD and wondered whether this became such an overriding issue that the performances would not measure up as valid theater. Such doubts, however, seem to have been answered by the increasing numbers of satisfied people who attend the performances.

Especially successful productions were adaptations of Sheridan's *The Critic*, Dylan Thomas' *Under Milk Wood*, and a striking performance of one of the oldest known literary works, *Gilgamesh*. Predating Homer by more than 1,000 years, it encompasses the life and struggles of the man-god Gilgamesh to achieve everlasting life. Directed by Larry Arrick (who also directed *Parade*), its bold imagery was suited to NTD's style. Director Arrick, who has been associated with the theater for nearly four years, describes the choice of *Gilgamesh* and the unique ability of the NTD in bringing this robust epic to life. "I was at the O'Neill with the National Theater Institute and suggested to David Hays a work of literature in which I was interested, *Gilgamesh*. It was a Sumerian composition, inscribed on clay tablets. It's mythic in nature, a series of poetic images. I was very excited by the possibilities of what could be done here. The company has extraordinary strength. They carve language in the air. Theatrically, their language is far more evocative than our speech is."

The NTD continued to "carve language in the air"

with television productions as well as stage works. Its interpretation of Dylan Thomas' *A Child's Christmas in Wales* with Michael Redgrave appeared as a CBS special. Prior to this, the company had also appeared in the NBC series, *Experiment in Television. Sesame Street,* the popular children's program, has also been a vehicle for deaf actors and actresses, and one, Linda Bove (pp. 68-69), has been a permanent resident of the "Street" for five years.

Petite, animated and dynamic, Linda is a vivid exponent of the NTD, an excellent example of the company's special aliveness. She wants to understand and to be understood and she expresses herself with constantly changing facial expression and body movement, as well as signing and speaking. On stage, moreover, she is exceedingly nimble, moving with a litheness and agility which is especially apparent in the gymnastics and tumbling in which nearly all of the members participate.

Nowhere is this more apparent than in her role in *Parade.* Portraying Billie Dove, the determined and persuasive leader of the deaf group, she must cover a wide range of mood and action. Called upon to dance, lead cheers and perform gymnastics, she invests all with a dashing exuberance. At the same time, during her efforts to encourage the group to achieve its goal and not lose hope, she brings insight and reflection to the more serious intent of the play.

In addition, the group has generated a spin-off from the main company—the Little Theatre of the Deaf, with two companies which visit schools, and perform in theaters and on *Sesame Street* each year.

And what of future direction for the NTD actors? In addition to the ensemble productions, there could be a place for these actors in other media also. Deaf characters frequently appear in various productions, and there seems no reason that these roles could not be undertaken by deaf actors. Such works as *Johnny Belinda* and *The Miracle Worker* are only two possibilities which come to mind. Some time ago, the television series *The Waltons* had a deaf character in its show. Television programming offers potential for deaf actors. In fact, there has already been a breakthrough. Linda Bove had a role in the popular daytime serial *Search for Tomorrow* for five months.

The former director of *Search for Tomorrow,* Bruce Minnix, believes strongly in the use of deaf actors in deaf roles. Describing the added realism they bring, he says, "Having a deaf actress play the role added reality to the production and to the other actors' roles."

Using a deaf actress presented a fascinating problem for the director. "For example," says Minnix, "Linda watches a hearing person very closely. Listening is the key. She could not be in a position where she couldn't see the other person's face. We had to make sure she was positioned so that she could always see the other people. And we widened shots to include her hands."

NTD director Larry Arrick also emphasizes the need for concentration and the propensity NTD actors have for it. "They must perceive, they must always be watching. This is an enormous demand. Exhausting."

Rehearsals last from 9 A.M. to 6 P.M., although the actors warm up with calisthenics at 7:30 so their day is even longer. Director and actors communicate primarily through an NTD interpreter, Nikki Kilpatrick. One of the hardest workers, she must be on call at all rehearsals to help with the director's changes and the actors' responses. Born to deaf parents, she learned to sign before she could speak, so that sign is quite literally her first language.

Translating a script into sign

Rehearsals can be frustrating. Words are not always readily translated into sign, and the NTD tries to avoid finger spelling since it is rarely effective dramatically. At times Bernard Bragg, who is sign master, is called upon to invent new signs. Playwright Jeff Wanshel, who helped create *Parade,* recalls just such a situation: "I can come up with a word or phrase—for example, the 'New Deaf Dominion'—and then find that no sign exists for it. Bernard Bragg may come up with one, but sometimes I have to change the word."

Developing and constructing an original production like *Parade* offers its own problems. The members of the company were heavily involved in the structuring of the play, contributing ideas and suggestions, objecting to and discarding others. "One of the problems with this particular original play," says Larry Arrick, "is that the subject is something I can only understand, not experience. It is a condition. I could stop up my ears with cotton, but it would not be the

Highlighting problem for deaf people in world of sound is how to dance without music. In foreground Bernard Bragg (on podium) directs while Julianna Field and other cast members impersonate street traffic.

A Deaf Dominion would have its own soap operas. In "As the Hand Turns," a nurse played by Julianna Field and a doctor played by Joe Castronovo discuss a crucial procedure through their surgical masks.

same experience. So I must try to impose a notion from my point of view on the piece. That, after all, is the point of the whole play. But the process takes a longer time, much longer, since the actors are involved so directly in the actual structure of the play. It can be tedious and time-consuming. Also it can be misleading. These actors are all graduates of college, so their experiences are not likely to be the same as those of all deaf people."

Arrick does not believe, as do some, that deaf actors are more expressive than others in face and body; they are, instead, different in their ways and means of expression. "It is essential for anyone working with them to acknowledge these differences and make them virtues." To do otherwise could border on condescension. Bruce Minnix noted the risk of this also. "We had to take care that we did not condescend and treat Linda as a child when we tried to catch her attention. Then, on the other hand, we could run the risk of ignoring it too much. The problem exists. We could be in danger of being too glib."

Group members are actors first, however. Arrick says: "Ego is an important element in an actor. Of course they're professionals and accept decisions for the good of the show. These actors have the same feelings any actor has, and they can be upset if their scene is cut, and resist. They are a company, however, in the real sense of the word. Part of the ego thing is 'I want to look good so I can get another job,' but these actors are assured of employment."

Inescapably, one is struck by the quietness of a rehearsal when the actors are signing and the director and the others listening and watching. Watching is vital for these actors—as it is for any deaf person. British author David Wright, who became deaf as the result of an illness at the age of seven, described the reliance on visual evidence by the deaf in his book *Deafness*: "Suppose it is a calm day, absolutely still, not a twig or leaf stirring. To me it will seem quiet as a tomb though hedgerows are full of noisy but invisible birds. Then comes a breath of air, enough to unsettle a leaf; I will see and hear that movement like an exclamation. The illusory soundlessness has been interrupted. I see, as if I heard, a visionary noise of wind in a disturbance of foliage. Wordsworth in a late poem exactly caught the phenomenon in a remarkable line: 'A soft eye-music of slow-waving boughs. . . .' "

There is "eye-music" in all National Theatre of the Deaf performances—a ballet of darting fingers and a symphony of fluid motion. The theater is meant to be entertainment, but it is also communication, and true communication is more than just the transmittal of information from one person to another. To be truly effective it must connect and reach out, establish contact. The lines from Paul Simon's song first admonish, then implore:

People talking without speaking,
People hearing without listening . . .
Hear my words that I might teach you,
Take my arms that I might reach you.

Audiences seeing *Parade* or lucky enough to attend other National Theatre of the Deaf performances will know that they have been reached.

In *Parade*, Ed Waterstreet plays the role of Mr. Silence, the Deaf Dominion's equivalent of Superman.

Linda Bove, as chief proponent of Deaf Dominion, exults as *Parade's* final parade nears the White House.

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By Michael Kernan

50th anniversary of step toward space

Goddard was photographed about 1900 in a tree with his mother at the Worcester, Massachusetts, home.

When Robert Goddard flew a liquid-fueled rocket 184 feet across a Massachusetts field, Man began his journey to the moon

March 16, 1926: Near a cabbage patch on Effie Ward's farm in Auburn, Massachusetts, three men and a woman, bundled against the cold, stood watching a curious apparatus of steel tubing somewhat like a jungle gym. One man approached the thing with a blowtorch on a long pole and touched it off. A sudden roar, which continued for about ten seconds, and it began to move—almost imperceptibly at first; then, gaining speed, it took off from the frame, zoomed 41 feet up, arched, plunged, and hit the frozen ground 184 feet away.

Robert Hutchings Goddard had brought the world perceptibly nearer the space age—which finally arrived 31 years later—by launching the first rocket using a liquid propellant.

A modest man who mostly kept his soaring dreams to himself, Goddard was to live and work in relative obscurity until his death in 1945 two months before his 63rd birthday. Only three months before he died, as World War II wound down, Wernher von Braun and the German scientists under him who had developed the V-2 long-range ballistic missile at Peenemünde came over to the Americans. When American intelligence officers asked him for details about the German rockets, one of the engineers suggested that they ask Dr. Goddard—of whom they had barely heard—about the principles. The design of a rocket built by Goddard in 1939 had, as he himself observed, essentially the same features as the German V-2 of 1944.

Even then, recognition was not forthcoming, though Goddard had developed the forerunner of the World War II bazooka and demonstrated it to the Army a few days before the armistice in 1918, and had developed liquid-propellant jet-assisted takeoff during World War II. There were 214 patents filed and issued in his name, ranging from the significant features of the modern rocket (in 1914) to an oscillator that anticipated the radio tube.

His monograph written for the Smithsonian Institution—his first backer and for years his only one, supplying most of his research funds from 1917 to 1929—was titled "A Method of Reaching Extreme Altitudes." In it he speculated that Man might send a payload to the moon with a multistage rocket. Goddard's speculations on moon flight attracted wide attention, but they were only a small part of that 1919 paper. Unknown to the public were four unsolicited reports Goddard made for the Smithsonian in which he spelled out his

Goddard with rocket before historic flight. Engine is at top, fuel and oxygen tanks are underneath.

dreams of interplanetary flight. They were kept secret at his request, and not published until 1970.

Some of his ideas were summarized two years earlier, however, by Frederick C. Durant III, assistant director for astronautics at the National Air and Space Museum, who has written extensively on Goddard. The ideas are remarkably familiar to a follower of space exploits of the past few decades. According to Durant, the first (1920) report alone discusses manned and unmanned space probes, photography of the moon and planets, gyro-stabilization, flight-path corrections by small rocket motors, solar-powered electric propulsion, tracking of spacecraft, a reentry heat shield—and the advantages of liquid hydrogen and oxygen as ideal propellants. By the third paper he was including a 1,200-pound manned "observation compartment" in his designs, while in the fourth he discusses the advantages of electron and ion rocket engines.

The *New York Times*, which in 1920 editorially scoffed that the inventor lacked "the knowledge ladled out daily in our high schools," printed a retraction 49 years later while Apollo 11 cruised toward the moon: "It is now definitely established that a rocket can function in a vacuum. The Times regrets the error."

By 1960 the federal government acknowledged that it had infringed on Goddard's patents for the liquid-propellant engine used in the Atlas, Thor, Jupiter, Redstone and Vanguard rockets. It settled for a million dollars, and Goddard's widow gave half to the Daniel and Florence Guggenheim Foundation, which had financed almost all of his research between 1930 and 1941 in Roswell, New Mexico.

Today, the monuments have been built, the books have been written, and fame has come to this representative of the great solitary tinkerer-inventors who are so much a part of America's legend.

But one thinks back to that day 50 years ago at Aunt Effie's farm. It was a Tuesday. Goddard met his machinist, Henry Sachs, at the physics shop of Clark University in Worcester, where he had been teaching physics for 12 years, and the two men drove to nearby Auburn, to Pakachoag Hill, with two tanks of liquid oxygen casually laid between them on the seat of the coupé and trailer jouncing behind.

The rocket weighed 5¾ pounds empty and 10¼ pounds loaded with gasoline and liquid oxygen. The previous December, it had lifted its own weight in the static testing rack, hanging in the air for 27 seconds, and now it was to be cast loose.

The advantages of liquid propellants over the ancient gunpowder-type solid fuel were that it was more powerful and could be metered and controlled. A major problem was directing the two liquids (oxygen and gasoline) into the combustion chamber. This posed great technical difficulties, because oxygen remains a liquid only below −297 degrees F. As it vaporizes, it creates pressure in the oxygen tank. Goddard used this pressure to force both propellants into the combustion chamber.

These two liters of liquid oxygen were the last that Linde Air Products Company in Worcester would be

Ready for the launch, Henry Sachs, an assistant, holds a blowtorch to the igniter tube.

Goddard sent this picture to the Smithsonian, calling it "The Empty Frame—after a long time!"

able to provide until April. So there was no room for mistakes. All morning the two men erected the apparatus, the two-foot-long motor on top, the fuel tanks below (they were to be reversed a few months later), ten feet of tubing connecting them, one line for gasoline, the other for oxygen. The sheet steel came from England. Valves and nozzles had to be designed and handmade as the project developed.

Noon came and went. Percy Roope, assistant professor of physics at Clark, arrived with Esther, Goddard's young wife. Mrs. Goddard was to operate the movie camera, which ran seven seconds.

At the farmhouse, Effie Ward ("She was right out of a book," Mrs. Goddard recalled) offered a last cup of hot malted milk, and the little group headed outdoors again, pulling on mittens and buttoning coats to the neck. It was 2:30 P.M.

Thirty feet away, turning a handle on an oxygen cylinder, Goddard let oxygen into the rocket. At liftoff the hose would pull free and a valve would shut on the rocket. The launch was simple: a blowtorch was used to heat an igniter filled with black powder above the motor, and when that started to burn, valves were opened, releasing gasoline and liquid oxygen into the combustion chamber. The last chore was to ignite a little alcohol burner under the liquid oxygen tank to speed its vaporizing.

Goddard and Roope stepped behind a protective sheet iron barricade. Sachs set off the black powder with his blowtorch, lit the burner and raced back to join them. Mrs. Goddard's camera, which had been recording all this, ran down.

A sharp bang. A white blast from the nozzle. A long pause, a lazy movement upward, then acceleration.

"Even though the release was pulled," Goddard reported in his notes the next day, "the rocket did not rise at first but the flame came out, and there was a steady roar. After a number of seconds it rose, slowly until it cleared the frame, and then at express train speed, curving over to the left, and striking the ice and snow, still going at a rapid rate.

"It looked almost magical as it rose, without any appreciably greater noise or flame. . . ."

The flight was 2½ seconds long.

One person of whom it made a believer was Mrs. Goddard. Before that day, she said, the whole business had seemed somewhat abstract. Seeing it go up, she could finally share his excitement and elation.

"He didn't say much," she recalled, "but you ask any inventor about his invention when it works for the first time, and there's just nothing like it."

They were worried about the reaction of neighbors, but there was none. "It was real noisy, but only for a few seconds," she said. The problem was to arise three years later, when a rocket burned up and set small fires in the field, and frantic phone calls by neighbors brought policemen up the hill looking for the remains of a plane crash.

Soon after that, the state fire marshal decided Aunt Effie's farm was too close to civilization, and banished Goddard's rockets from Auburn, ultimately resulting in the move to New Mexico.

Mrs. Goddard, who still lives in the family home in Worcester, did remember an audience for the early rocket shots, however.

"There were woods around the field," she said, "and after a rocket went off those trees would erupt little boys. Two dozen of them. The woods were alive with them. Sneaked up there to watch. When we had a fire, they'd come out and help stamp out the embers."

It was a shame, she added, that Bob Goddard never lived to see the moon rockets whose feasibility he had predicted with such prescience—not merely predicted, but demonstrated—at a time when the world's other space pioneers were still working equations on paper.

Percy Roope, today living in retirement in California, remembers that launch clearly. Especially he remembers Dr. Goddard's immediate reaction:

"He was calm, he always was quiet and cool. But you could tell he was really excited. He flushed up a bit. . . . Afterward we went back and had coffee and talked about it."

Roope lives very close to Vandenberg Air Force Base, a center for rocket missile tests and experiments.

"Oh yes," he observed quietly, "I see 'em going by every so often. . . ."

After the flight all the pieces were collected for study. Goddard, center, is flanked by Henry Sachs, left, and Percy Roope. Repaired and reassembled, this very same rocket was flown again on April 3.

"If this musical runs long enough to generate word of mouth, the word is likely to be 'blah.'"

Photo: Kenn Duncan

"It is not clear how the notion entered the producers' heads that the saga of Joan of Arc had the makings of a musical comedy. At that crazed moment, they should have consulted an exorcist."

Consumerism in the arts; or, theater-going made safe.

Over the years, TIME has become famous for the independence of its critical eye. And for its ability to administer a good, sound spanking when it seemed appropriate.

Indeed, TIME 's film and theater criticism is characteristically so brimful of personal enthusiasm, both pro and con, that people tell us they have gone to see bad plays precisely because TIME condemned them so interestingly.

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TIME

The Weekly Newsmagazine

Text and photographs by Paul Boorstin

Liberia's fading echoes of the old American South

In this African republic it has become tactful to play down the black carbon-copy image of our antebellum aristocracy

There they stand, monumental riddles in the middle of the West African rain forest: old mansions with dignified columns gracing breezy piazzas. Elderly remnants of a black aristocracy live here, in homes built of mulberry, black gum and white locust. Their corner posts are hewn from walnut, a wood the people here call "natural iron" because the "bugabug" termite can't bore through it. Though most walls are faced with zinc siding now, the lineage is unmistakable. These homes belong to the antebellum American South, a bygone age mellowed by ambient nostalgia in the United States, but an era in Liberia still clinging to life by a thread. Soon, "natural iron" or no, the mansions and their aging owners will vanish for good.

This little nation, with a seacoast 370 miles long on the Atlantic bulge, has a history that strangely echoes parts of America's own. The blacks who landed at Providence Island, Liberia's "Plymouth Rock," in 1822 were former American slaves who had come to found their own new land. The Old World of repression that these immigrants—Pilgrims in reverse—fled was the United States of America. They called themselves Americo-Liberians and were essentially Americans, born and reared, with America's language, social ideas and stern Protestant religion. They had little sense of their original African roots, and no firsthand experience of life in the tropics. The American Colonization Society, a partly do-good, partly get-rid-of-the-blacks organization, funded with indirect assistance from the U.S. government, helped finance the long ocean voyage, but once they reached African shores the black settlers were on their own. Their Promised Land (about the size of Ohio, and bought from local tribal chiefs with muskets and tobacco, rum and umbrellas) turned out to be infested with malaria and hostile indigenous peoples. Yet, somehow, enough settlers survived the first few decades to found a republic, signing their Declaration of Independence in July of 1847.

Eventually, with American aid inspired by our nation's sense of guilt, the settlers built a land based on resources first of sugar and coffee, then rubber and iron ore. It was to be bad luck all the way: coffee plants from Liberia started the coffee industry in Brazil—which in time took away the market. And in the 20th century, never-prosperous Liberia was about to be "saved" by American-financed green mansions—a million acres of Firestone rubber plantations—but the depression and synthetic rubber withered that hope.

Liberians had christened their capital Monrovia after James Monroe. They adopted the dollar as currency, raised a Capitol building, appointed a Supreme Court, elected a Congress and a President. Yet, ironically, like the America on which they patterned their

In Careysburg, Emma Knuckles displays her red, white and blue quilt—colors of Liberia and U.S.

Under its sheathing of zinc, the Tyler mansion in Arthington is, architecturally, strictly Dixie.

new nation, Liberia's own system was also flawed by inequality. For the minority whose ancestors were immigrants from America (about 50,000 today) made up a powerful (and often corrupt) oligarchy, while the indigenous majority who make up more than 97 percent of the population, tribal peoples like the Kpelle, Gola, Kru and Mandingo (about 1.6 million), remained voiceless and exploited.

Driving inland from Monrovia, my car passes a deadly green mamba lying by the roadside where it had been stoned to death. Small plots of corn, sugarcane, rubber trees and palms blur into the dust as we churn down a road of powdered red laterite. We are en route to the settlement of Clay-Ashland, little more than an hour from Monrovia, yet seemingly a century away. A sense of urgency sparks this trip, for I have arrived at a time when the relics of Americo-Liberian culture teeter on the verge of extinction. President William R. Tolbert (like his predecessor, William V. S. Tubman, an Americo-Liberian), who came to power in 1971, seeks to join the pan-African movement, to glorify Liberia's cultural bond with its African neighbors instead of the awkward historical link to America which now smacks of colonialism. It is to discover what remnants of the old way of life still survive in pockets removed from the capital that I have come here, to record what I can before the Americo-Liberians' own neglect, the elements and the fast-changing times obliterate the old ties of this African nation to our own.

My guide is 44-year-old Americo-Liberian R. Vahnjah Richards, Liberia's leading sculptor, who currently is campaigning to establish the first full-fledged art gallery in the nation. His work graces many of Liberia's public monuments and the Capitol building, but in that blend of idealism and common sense any artist needs to survive, Richards also silk-screens stop signs for the highway department and supervises the chiseling of gravestones.

We drive beside the lazy St. Paul River, a murky green and brown waterway that for generations was the principal artery to the capital, until a road was carved out of the forest. Abruptly, Clay-Ashland sprouts out of the trees, each building planted seemingly at random, isolated from the next by overgrown clearings and the gutted husks of cars. The settlement was founded in the mid-1840s.

In Clay-Ashland, the widow Mrs. Danlet Brooks holds a portrait of her Kentucky-born grandmother.

Our pickup crunches to a stop on a bed of milky quartz, before the home of the late Reverend William Brooks. Vahnjah leads me over to the shady front porch of this squat house, built in 1919, with its gray zinc siding and green shutters, to pay our respects to the widow Danlet Brooks, a sprightly lady in her late seventies. "Vahnjah Richards!" They greet each other with the traditional Liberian handshake, clasping hands, then gently snapping middle fingers as they draw the palms away. "Vahnjah, you never visit me," she teases him. "Old man, I am vexed with you!" Liberian English has an antiquated ring, for it froze on reaching African shores, retaining some expressions used in 19th-century America. Danlet sits down to eat a bowl of rice by hand, a few curious clucking hens pecking at the leavings that sift onto the floor.

"Shoo!" Widow Danlet Brooks scatters the chickens in a squabbling flurry of feathers. When I ask her if she likes it in Clay-Ashland, Mrs. Brooks explodes with goodnatured indignation: "Like it here? I was borned here!" She cradles a precious faded photograph. "My grandmother was from the States. I've forgot the town, but it was in Kentucky, that's for certain!" So many of the town fathers grew up in that state that "Kentucky" was Clay-Ashland's original name. Like the immigrants who colonized America, these African settlers christened their new homes after comforting, familiar places. (New York, even smaller than Clay-Ashland, is just down the road.)

Widow Brooks clomps energetically up a rickety staircase to show us her "company room," a few pieces of wooden furniture on plank floors, with inspirational photographs and newspaper clippings pinned here and there to the walls. Then she leads us to her late husband's study, left respectfully messy, desk stacked with yellowing sermons and religious tracts, just as he would have wanted it. "My husband was a born Baptist, chaplain of the Liberian Senate. Myself, I've been organist and treasurer. I've served the church in every capacity except pastor." Since her marriage in 1917, Mrs. Brooks has held to the strict precepts of her Southern Baptist sect, refraining from alcohol and dancing. She remembers other pleasures shared with her husband: sunny Easter egg hunts on the lawn, and the "Christmas bush," a local plant they cut down and decorated with colored paper in December. There was also Thanksgiving, celebrated the same day as America's, but with the Yankee turkey replaced by a traditional Liberian goat soup.

When the widow leads us downstairs to the porch, I discover a silent observer has come out of hiding to perch on a chair, eyeing me with interest. She is a shy "up-country" girl of 12 with deep dark eyes, squirming uncomfortably under our gaze. The widow calls her "Mary," and Vahnjah explains that Mary belongs to the Kru, one of Liberia's indigenous tribes. Mary's parents have left her as a ward or "foster niece" of Widow Brooks, to help with menial household chores in return for room, board and schooling. Liberia's critics attack this still pervasive system of work without pay as an extension of the slavery which the Americo-Liberians came to Africa to escape, saying the descendants of American slaves have here become the

The sculptor Vahnjah Richards, an Americo-Liberian, leans against a sample of his work, mini-elephants.

Thomas Coleman, son of a late U.S.-born president of Liberia, sits under his "Home Sweet Home" plaque.

masters. But the Americo-Liberians defend the practice as charity, a generous way for the "haves" to welcome selected members of the indigenous peoples into the ranks of the country's affluent. In a town like Clay-Ashland, with so many aged Americo-Liberians, the upcountry "nieces" and "nephews" do most of the housework. Glowing from our visit, the widow Brooks clasps our hands warmly in farewell.

The aroma of baking cornbread wafts through the forest from a red house, the home of Vahnjah's cousin. "Come in and sit a spell," says Samuel Simpson, short and brisk and eminently dignified in knee-high rubber boots and a fedora. He leads us past a pole flying a red, white and blue Liberian flag and squeaks open a screen door. Though the shadowy interior is austere, with only a few straight-backed chairs, the rich smell of home cooking warms the room with its own welcome. Rebecca Simpson steps out of the kitchen. The tall, delicately slender old lady is so startled to see us she almost drops the plates she is carrying. "Vahnjah!" she laughs, bright eyes flashing over strong high cheekbones. "Where you come from? You sneak up like a rogue!" In one hand she clutches a piping hot platter of cornbread, her other hand balancing a plate heaped with black-eyed peas, butter beans and collard greens, the traditional food of the American South. "Rebecca's the best darned cook in Clay-Ashland," her husband boasts between mouthfuls.

But Rebecca harbors another, secret passion, secret only because no outsider has ever bothered to ask about it before. Mrs. Simpson is so proud of her creation that it doesn't take much prodding from Vahnjah before she hurries into the bedroom for the dramatic unfurling. The homemade quilt is an unlikely pattern of roses and Caterpillar tractors. In the tropics a quilt might seem superfluous, but here this Southern craft serves a commemorative, patriotic function. Mrs. Simpson and a friend took two months to sew this one honoring the Department of Public Works for building a road to their town. And in nearby Careysburg I met a Mrs. Emma Knuckles, who had sewn a coverlet in the form of the Liberian flag (p. 83). According to local lore, in the 1870s one Martha Ricks from Clay-Ashland stitched a quilt and presented it to Queen Victoria herself. Rebecca Simpson persuades us to linger for a slice of delicious papaw pie. "You visit Thomas Coleman, hear?" Rebecca calls out to Vahnjah as we take our leave. Coleman, Vahnjah's uncle, is by reputation the oldest and wisest man in Clay-

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Ashland. "You want to learn about the old days, you visit Thomas. If he'll see you."

Thomas Coleman lives in a cramped, stuffy apartment above the town's general store, a single counter selling cashews, Ovaltine, soap, candy, beer and powdered milk. Although his joints are stiff from age, the old man stubbornly welcomes us with the finger-snapping Liberian handshake. Eighty-six, blind and terribly frail, carrying himself with the cautious slow motion of his years, he leans on a "foster niece" from up-country, shuffling painfully into his living room, and eases down on a plastic-covered sofa adorned with lace antimacassars. A framed photograph of a granddaughter who was Miss Liberia hangs on the wall.

Coleman leads us to a wooden swing on his apartment porch where he rocks gently, his face beaming and strangely childlike, as though he were sitting outdoors in the sun instead of staring blindly at these dusty windowpanes. His father was the late President William Coleman (1896-1900), who emigrated from the United States in 1854 at the age of 15. "He came from Fayette County, Kentucky, at the time of *Uncle Tom's Cabin,* and he had the temperament of Lincoln." When I ask Thomas Coleman how his father felt about leaving America, the old man's yellowed broken teeth span a broad smile: "Well, you know I mean . . . he was *very* happy to leave America. He used to be a slave, you see. Yes sir, those that came from the States at that period enjoyed their freedom. You know our national motto: 'The love of liberty brought us here.' "

As we leave him, Coleman, like the others, thanks me warmly for the visit. An outsider's interest is an overwhelming compliment, something the people of Clay-Ashland have seldom seen before. For no one ever comes to visit them, not anthropologists or historians, not even tourists or curiosity seekers.

Old ways make way for a new order

In Monrovia a new order of things is already emerging. The traditional morning coats and top hats that the Americo-Liberians wore on formal state occasions have been replaced by President Tolbert's "swearing-in suit," short-sleeved, open-necked and down-to-earth. The lavish courtly balls, where until recently guests performed the quadrille and toasted each other in bourbon, have been supplanted by an austerity more in keeping with the image of a "developing nation." The case of Matilda Newport Day, a festival celebrating a victory over the indigenous peoples in 1822, is revealing. When the tribal warriors charged, so the story goes, Americo-Liberian Matilda Newport lit a cannon with a coal from her pipe, putting the enemy to rout. Celebrating the trouncing of the tribal majority by the ruling class seems inappropriate today, and the annual Matilda Newport Day festivities are muted.

Instead, at the Cultural Center in Monrovia, performers rehearse the dances of the Gola, Kpelle and Kru tribes, eager to join the national troupes of other countries in pan-African cultural celebrations. Liberia wants to be accepted in Africa as an equal now, and the old historical ties with America are an embarrassment. The still dominant—politically and economically—Americo-Liberian elite is allowing the artifacts of its own past to decay unnoticed: architecture, custom and oral history.

As we drive out of Clay-Ashland, Vahnjah Richards points toward the gutted skeleton of a concrete mansion, where the forest foilage sprouts in every room like garish green vinyl furniture. This is the carcass of the house of Daniel Scott, sculptor, who lived here until 1954. Now it is inhabited by papaw trees. With the passing of the Thomas Colemans, the Simpsons and the widow Brooks, their homes will welcome the same silent and eternal tenants.

Present and past: a modern office building in Monrovia (above) and the decaying town hall and courthouse in the settlement of Clay-Ashland.

By Benjamin Forgey

Arttransition is still in transition

The materials are fire and earth and TV,
water, air, mirrors, plastics, lasers—
and talk, talk, talk, on and on and on ....

"It is like going back to old times," artist Geny Dignac said wistfully, looking over faces familiar from the urgent era of the Sixties. There was a mellow, almost nostalgic mood hovering around "Arttransition," a recent gathering of luminaries and other folks from the international avant-garde that would have been unthought of at any such meeting ten or five or even three years ago.

The place was familiar also to most of the participants: the Massachusetts Institute of Technology, which adopted art in those heady days of the Sixties. Arttransitioners were talking in clusters in an MIT courtyard, a get-together of computer, laser, sound, earth, air, water and fire artists. There were very few conventional painters and sculptors.

Most in the group had just emerged from hearing a brilliantly appropriate keynote to the five-day conference by an erudite Englishwoman, Jasia Reichardt. She is a writer, critic and long-time organizer of exhibits of experimental, technological art, and she titled her witty address about art and science "Unfair to Robots."

Arttransition was a word invented by Otto Piene, himself an artist and host for the affair as director since 1974 of MIT's Center for Advanced Visual Studies (CAVS). Piene's concept and Miss Reichardt's dovetailed: art is in a state of transition because society has attained an altered relationship with the machine.

Miss Reichardt pointed out that machines are becoming even more like their creators in functions if not in appearance—"computers are robots without human form," she mused aloud to a sympathetic and engaged audience. Drawing upon a store of ambivalent examples from the Talmud to science fiction, she decided that our attitudes toward our creations are confused, inhumane (where not worshipful) and out of date. No one doubted her conclusion. Indeed, the conference revolved around expressions of alternative views about the nature of the necessary accommodation between humankind and its technology, and particularly the role of art in that accommodation.

The long-ago—as art styles are measured—Sixties seemed to confer a heightened sense of significance to words and acts. Art and Technology were not two words then, but more or less a single word—Artand-Technology—used as a banner or as an epithet. MIT's Center for Advanced Visual Studies, established in 1967, was one of the less ephemeral acts taken under the impetus of the A&T movement, though one can't be entirely sure even yet whether art was adopted or conquered at MIT. The Center was founded in response to "the rapidly expanding perimeters of the contemporary world" in the words of Gyorgy Kepes, its first director and guiding spirit, and its aim was to set up "a creative dialogue between the two most vital aspects of our cultural life." (SMITHSONIAN, May 1970).

Kepes' belief in the "convergence of art and science in common social goals" has been lifelong; it was in-

Videotapes are the medium for artist Nam June Paik who conceived a work employing cellist Charlotte

Benjamin Forgey writes on art and architecture for the Washington Star.

Moorman. Miss Moorman plays Paik's unique "TV Cello," an electronic instrument capable of cacophonic sound, as Paik scans surroundings with videotape recorder projecting on several cello screens.

Prado, Madrid

cubated in Europe close to the Bauhaus, as was so much of the spirit that reemerged in Sixties America as A&T. But the Arttransition conference found Kepes, now director emeritus of the Center, in a ruminative mood, warning against the "dangerous boomerang of a cult of newness" and cautiously suggesting the follies of "technological fetishism."

Otto Piene made the point that "we're dealing with reality now, not just fabricating these wonderful statements to make everything good and nice." "Art and Technology today is more natural," he continued. "For a year or two, back there, it was some kind of target for inflated critical pronunciations. Everybody had to get a shot. Today I suppose there's a broader realization that this sort of art does not have to be done by everybody, just by some people."

Some of the people have been doing it now for close to 20 years. A&T has become a tradition, hardly a matter of controversy, ignored now by many art critics for its tendency to cross borders, to become art plus something else, and supported on the other hand by its own loyal legions of intellectuals and institutions. CAVS, of course, is one of the more prestigious of the bodies supporting Art and Technology or environmental art or expanded art—call it what you will—for it is not so much a cohesive movement, certainly not a visual style, as it is an impatience with the customary boundaries and protected purities of art.

Among the technological arts that have become "natural," as Piene said, is video art. Its birth can be roughly calculated from the October day ten years ago when artist Nam June Paik purchased one of the first commercially available Sony videotape recorders in Manhattan.

Any sort of avant-garde get-together would hardly be complete without Paik, the Korean visionary who virtually discovered television as an artist's medium, and since then has been going about making fun out of art with a disjointed abandon that superficially belies his intensity and intelligence. ("The cathode ray tube will replace the canvas" is his phrase.)

Paik himself seldom goes to conferences these days without Charlotte Moorman (p. 89), the old-hand avant-garde cellist for whom he created the once infamous "TV Bra" and, more recently, the "TV Cello." The pair gave a performance on the instrument—"the first new cello since 1600," Moorman announced with a hectic flair—at Arttransition's main social gathering. Paik casually flicked the videotape recorder upon his ever-diminishing audience, whose images (sometimes distorted) appeared on the three television monitors that make up the body of the cello. The cello is strung like the real thing, "but that's where the resemblance ends," Miss Moorman commented happily, plucking or bowing a variety of screeching, scratchy, amplified noises from the instrument. Paik adjourned for a leisurely supper, leaving the video recorder with someone else, then he returned for a little while and left early. So did almost everybody else.

Paik's studied casualness masks earnestness. Most

Based on Velázquez painting, *The Maids of Honor* (left), Juan Downey's videotape art suite exemplifies, perhaps, his vision of marriage of architecture and video, "a generalized cathode-ray tube within which we float as electronic particles."

Is this a put-on? Artist Juan Downey, in metaphysical exercise, or just for fun, dons a mask—of himself.

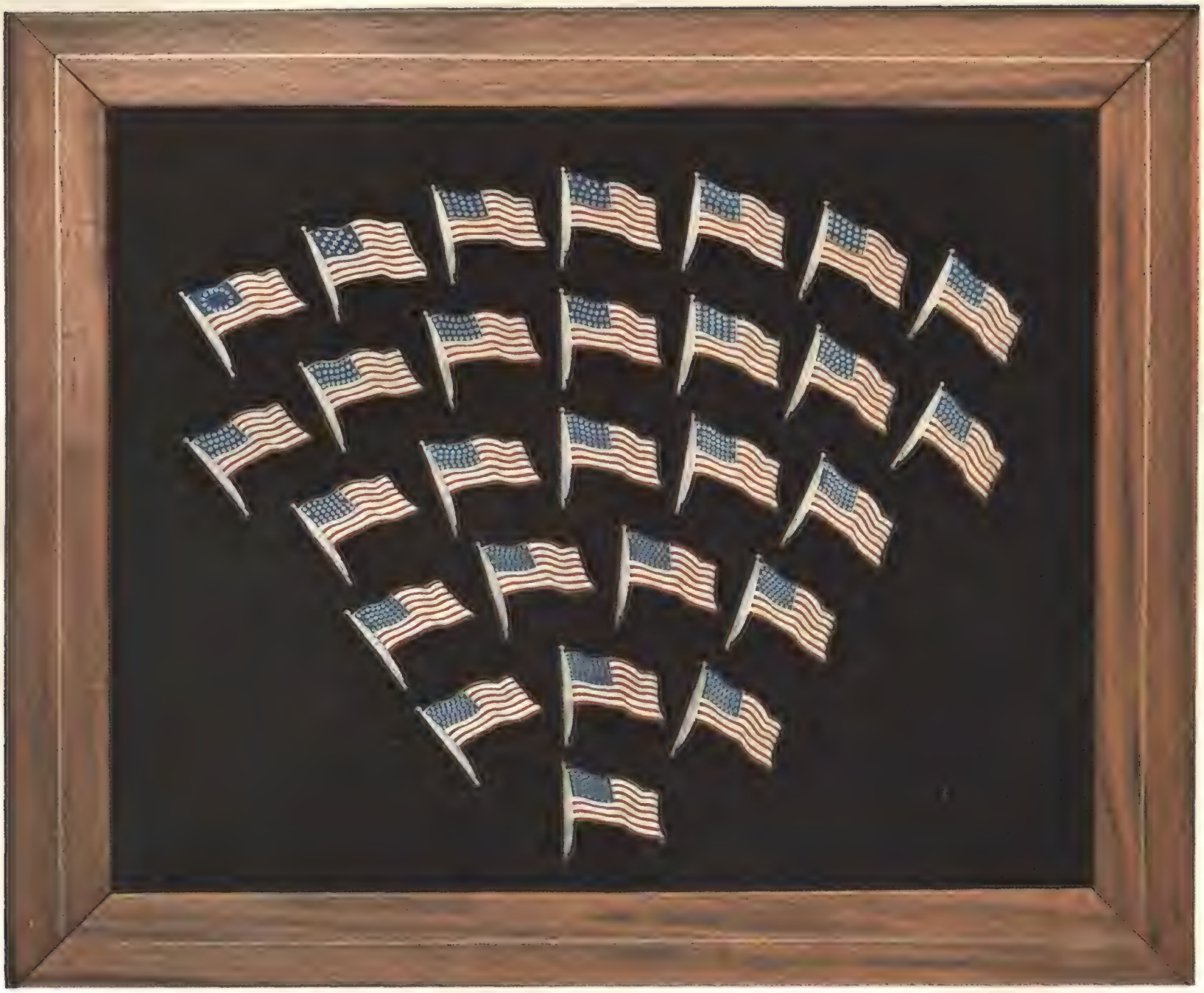
video artists and theorists (the two seem inevitably joined) don't hide it. As with Paik, the theory is generally more interesting than the art, which tends to be derivative, too technical, self-important, obvious and outrageously boring. Always there are redeeming exceptions. At Arttransition one of the exceptions was Juan Downey's technically adept, conceptually beautiful work based upon the potent images in the Velázquez painting *The Maids of Honor.*

A video panel injected some needed turbulence into the smooth theoretical waters of the conference. Not for nothing did Piene assign Matko Mestrovic, an avant-garde Marxist intellectual from Yugoslavia, to the panel: even the title of his speech, "Arttransition versus World Transition," suggested that he detected an implicit and unacceptable art-for-art's-sake bias in many of the goings on at MIT.

Video theory is inherently political because the medium is inherently social; also because, as radical Aldo Tambellini fairly shouted, television is "a tool as powerful as the atomic bomb." Little wonder that most video artists, many of them never trained as "artists," perceive their roles in social, educative or revolutionary terms. Tambellini demanded that his video comrades cease "playing with the little gadgets" and adjust their aims to political necessities. Others, perhaps fonder of their little gadgets, called for major changes in the distribution system, an opening up of the airwaves. Everybody called for an escape from the enclave of art.

Actually, the boundary-breaking social-political impulse was not confined to the videotapers, though it was strongest there. Christo, the environmental wrapper and designer of the "Valley Curtain" in Rifle, Colorado, presented himself as an artist-provocateur in his latest manipulation of scale: a proposal to construct a 24-mile "Running Fence" 18 feet high in a rural area about 40 miles north of San Francisco. The most exciting part of the project, he said, is the invisible part, that is to say, the social, legal and political uproar it has caused for the past two years in conservative Sonoma County.

Consciously to seek (or at least to find) social involvement at some level (usually pretty far up front) in the work of art was in fact the hallmark of the Arttransition "style." All the way up front was James Seawright's computer-controlled bank of lights installed in the Seattle airport (and shown in a film in Cambridge), a visual display programmed to respond to viewer participation (through a panel of buttons to push). Seawright called it "a primitive effort to have a computer mediate a specific environment." Somehow one felt a bit more comfortable with less obvious manifestations of the impulse. Geny Dignac's "fire statements" in the Arizona desert could not be less obvious. They're pure mysticism, perhaps, but somehow informed by an ecological consciousness. German artist Jürgen Claus is perhaps the first person consciously to "use the ocean as an esthetic tool," turning ecology into artistic expression. It may be reassuring, however, to know that a few individuals didn't fit the mold at all. Maryanne Amacher, a CAVS fellow, for two years has listened to and contemplated sound piped into her MIT studio from a hidden microphone in a deserted



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pier on the Boston waterfront: an absolutely strange, contemplative, somehow touching bit of research.

Most conventions are tiresomely wordy. Arttransition, its subject notwithstanding, was no exception. In fact, there was not all that much art to *see* at MIT, unless one chose after a morning and afternoon of talk to mesmerize oneself in videotape recordings and film viewings for five or six hours just to top off the day in cheery fashion.

The most ballyhooed visual production belonged fittingly to Piene, who was to stage yet another "sky event" on MIT's Briggs Athletic Field. This one, co-produced by Alejandro Sina, was a giant "neon rainbow" consisting of a 300-foot-long polyethylene tube filled with helium to be floated in an arc over the field, with rows of red neon rods suspended perpendicularly from its underside.

There is maybe something comical and wrong about watching some technological art pieces unfold, like being backstage at a good play: the result is more interesting if you don't know the tricks. Watching Piene's arc being pulled into place by a couple dozen MIT students—the only students to my knowledge who showed any interest at any time in the doings of Arttransition—gave one plenty of opportunity to reflect upon the infatuations of technological artists, so frequently fixed upon the scale and the efficiency of machines, and so often disappointed in their own productions, which are meager by comparison. Piene of course has done it both ways. The West German army helped to raise his monumental rainbow for the closing ceremonies of the Munich Olympics.

My train of thought recalled an impassioned, surprising observation made the day before by Harriet Casdin-Silver, who has been laboring five years trying to make art in the new magical technological wonder of holography (using lasers to produce what in effect seem to be three-dimensional photographs). "People are always saying the technology is far ahead of the esthetics," she said. "That is exactly wrong. The technology is restrictive, primitive. We are forced to make compromise after compromise after compromise until the piece we end up with is no longer what was present in our souls."

Still, for me, a lover of cities at night and of deep clear starry skies, as who is not, the wait for Piene's

Students help to ready 300 feet of helium-filled polyethylene tubing which is soon flung heavenward in a giant arc to triumphantly form Otto Piene's "Neon Rainbow," a dancing counterpoint of curves.

rainbow was worth it. The unforgettable piece, making counterpointed S-curves against the sky (the neon rods always several steps behind the undulations of the translucent tube) like some kind of great nature-driven drawing, whooshing in the cold wind, neon lights diminished and blinking softly, slight straight accents to the night—well, I mean to say, a giant neon rainbow is the kind of technological art to carry in the mind, as I have been doing since the end of the conference called Arttransition.

Perhaps its gentle technological poetry is a dream, an illusion. It was not at all an unambiguous signpost: rather small against the city lights as one walked away, and literally invisible to the city it celebrated. Probably no more than 100 souls saw it, in total. Piene's rainbow, and this is the main point, was a welcome antidote to the desire shared by so many Arttransition participants, which is to turn art into something else. The danger, of course, is that in "liberating" art, art will disappear in a "totally media environment," a phrase with truly terrifying implications. Piene's piece emphasized art and not technology. It was a celebration of the spirit, not the machine. Even the touch of comedy surrounding its gradual inflation on that frozen field seems refreshing, after the fact.

It is a fine dream and a necessary one, this idea that art can humanize the machine. In this sense, however, it is probably not unfair to say the conference resolved nothing. But if there was any one lesson to be learned from the goings-on at Arttransition, it was that the goal must be approached with the sort of modest grace Piene demonstrated. For, as Piene himself had gently cautioned, "This entire development that you call Art and Technology will take a hundred years or more to really mature. The state of transition will go on for quite awhile."

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Examples at Smithsonian show plaited hair in brooch, lower left, "Prince of Wales" curl, lower right, and woven hair used in other pieces, including lyre-shaped mourning brooch.

By Michael J. Bernstein

Hair jewelry, locks of love

A strand from the beloved, suitably mounted, expressed sentimental Victorian notions of courtship and the obsession with mourning

In the 20th-century whiz-bang world of pop and op art, few critics would raise an eyebrow if they strolled into an art gallery and found on exhibition two banana peels and a bunch of seedless grapes stuck to the canvas with a generous serving of extra crunchy peanut butter. But despite all the far-out creations of the Sixties and Seventies, the Victorians of stodgy old England may have outdone even Andy Warhol.

Thousands of pictures, rings, necklaces, brooches, pins, earrings and wreaths were made of human hair in England, and popularized later in the rest of Europe and the United States, from the late 1700s to the late 1800s. Today, with increased interest in antique pieces in general and the Victorian period in particular, collectors observe that renewed attention is being paid to hair jewelry, or the "jewelry of sentiment," as it was called. Interest and, accordingly, prices have increased. A New York City collector, for example, says a ring made with woven hair, which she bought for $35 several years ago, is now worth $400. In addition, the

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Hair was braided around flanged gold bands to produce matching rings.

Smithsonian Institution and other museums with hair jewelry collections have noted an increase in inquiries about jewelry of sentiment.

Hair jewelry grew into a huge industry by the mid-1800s when mass-produced pieces appeared with an all-purpose look. A hair brooch might be used by a grieving widow or a young sweetheart. In the 1840s and '50s—the height of popularity for this type of work—hair jewelry and pictures were made by both professionals and amateurs. Hair art became so popular that ladies were urged to learn how to make the jewelry themselves and thus avoid being hoodwinked by unscrupulous merchants who might substitute the hair of a stranger for that of the dearly beloved. During this period, Grace Darling, daughter of a lighthouse keeper, rescued the survivors of a disastrous shipwreck. She became a national heroine and cut off nearly all her tresses to give to her many admirers.

Unfortunately, as one collector says, "most of the homemade pieces of the time were made with love, affection, and a great deal of ineptitude. . . ." Still, the craft thrived, and in the mid-1800s *Godey's Lady's Book* and *Peterson's* magazine printed seemingly endless sets of directions for making hair rings, brooches and the rest.

The hair first had to be sorted into lengths and tied together very tightly, according to *Peterson's*. Next, it had to be placed in a saucepan with a pint and a half of water and some baking soda, and left there for 15 to 20 minutes. After

Broad plaits of hair unite two, perhaps forever, in this brooch.

the hair had been hung out to dry ("but not near a fire"), it was divided into bunches of strands of 20 to 30 each, with every hair the same length. Each bunch was then knotted and a small weight tied to a quarter of a yard of the hair with packthread. The other ends of the hair strands were gathered together, firmly tied, and then gummed with cement composed of equal parts of yellow wax and shellac, melted together, mixed and rolled into sticks. Depending on the pattern, the hair was sewn or woven into jewelry or pictures.

At the height of popularity of hair jewelry, women all over Europe might carry a fitted box containing tweezers, knife, curling iron, gum and a porcelain palette, always at-the-ready to weave a hair wreath or bracelet. Queen Victoria for years wore a bracelet containing the portrait and a lock of hair of her perennially mourned Prince Consort.

Victorians were apt to have a piece of hair art made for any occasion. One brooch, for instance, commemorated the night that Inveraray Castle was burned: October 12, 1877. A more conventional occasion for exchanging hair jewelry was marriage. With their penchant for romanticizing almost everything, the Victorians found human hair—so personal and long-lasting—a perfect vehicle to express their love.

By far the most popular subject for the jewelry of sentiment was the memory of the dead, probably because Victorian matrons had to spend several years in full or half mourning, and on numerous oc-

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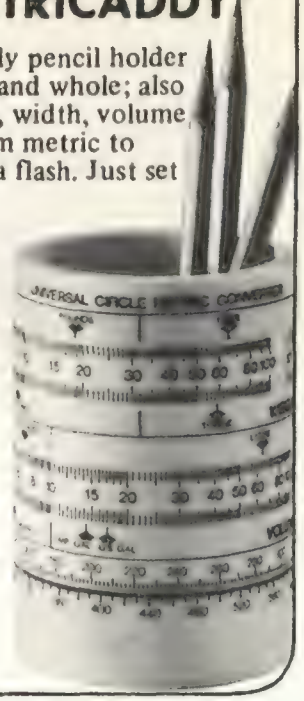

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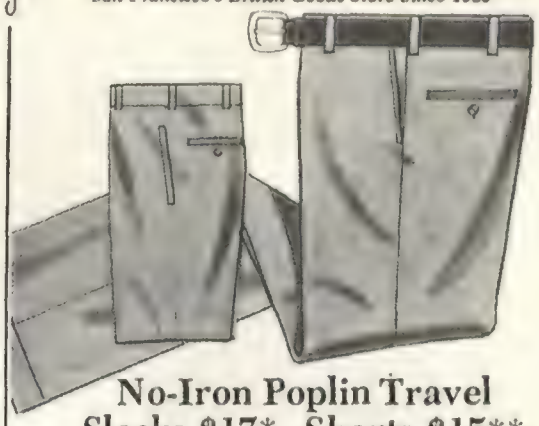

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Hair from two friends has been gathered and loosely interwoven to form this symbol. It was once a pin, now made into a ring.

casions had to wear some symbol of mourning. At such times the only kind of jewelry permitted was the black mineral, jet. When the formal mourning period was over, a curl or strand of braided hair could be enshrined in a compartment of jet jewelry—forever preserving the memory of the departed.

If a Victorian customer found hair jewelry too commonplace, there was always the hair tree. One could order a family tree made with the locks of all deceased members. The gray trunk was woven of the hair from the elders of the clan, and the branches tipped with the lighter locks of the young.

The hair picture was perhaps the most ambitious and successful form of hair art. This was composed of fine, extremely tough threads of gold, black or brown hair embroidered into a background of pale-hued satin or watered silk. (Victorians felt that red hair was not appropriate for pictures and kept it for jewelry.) The subject would generally be some conventionally melancholy motif: the weeping willow, symbol of lost love; the cypress tree, symbol of general mourning; the tomb of the departed. Especially discriminating customers might order a hair picture showing all the elements: tomb, mourning family, cypress and weeping willow, with leaves woven so as to give a waterfall appearance, like tears rolling off a face. As a final touch, the artist might use hairs from the father's side of the family on one half of the scene and hairs from the mother's on the other.

Eventually the fad abated, and the fascination turned to disgust. A display of hair art was considered in poor taste. But a portion of an advertisement, written in all seriousness and quoted by Frances Lichten in *Decorative Art of Victoria's Era,* reveals what the jewelry of sentiment was designed to mean:

"Hair is at once the most delicate and lasting of our materials and survives us, like love. It is so light, so gentle, so escaping from the idea of death, that, with a lock of hair belonging to a child or friend, we may almost look up to heaven and compare notes with angelic nature—may almost say: 'I have a piece of thee here. . . .'"

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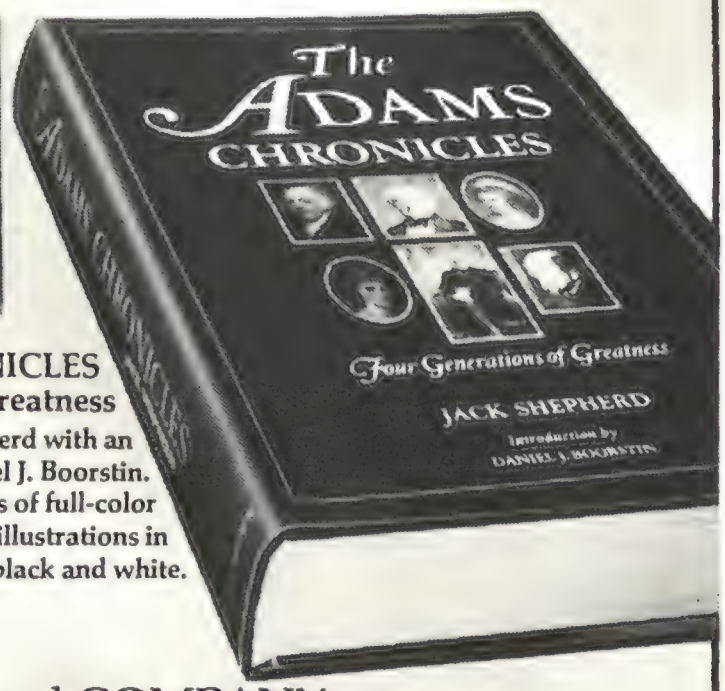

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Book reviews

Lord Leighton
Leonée and Richard Ormond
(Yale University Press, Published for the Paul Mellon Centre for Studies in British Art (London) Ltd. $45)

Both Leonée and Richard Ormond have already produced books on 19th-century British art. Mrs. Ormond wrote about the novelist-illustrator George du Maurier and Richard Ormond on the Anglo-American John Singer Sargent, who was incidentally his great-uncle, as well as cataloguing the early Victorian portraits at London's National Portrait Gallery. This lavishly illustrated book (there are 194 black-and-white and ten color plates) shows that they are qualified to do justice to that remarkable painter and social phenomenon Frederic Leighton.

I use the phrase social phenomenon because Leighton was not only a leading painter in Victorian England but also an important figure in contemporary society. He achieved success early. His *Cimabue's Madonna* shown at the Royal Academy in 1855, when he was not quite 25, was bought by Queen Victoria and established his reputation. Leighton never had to struggle to live, as his father gave him a comfortable allowance which he supplemented with a substantial income from his paintings. Leighton's striking presence, his Jovian head with the thick curly hair and beard, the ease with which he moved in society, and his friendship with the Prince of Wales, marked him as the obvious president of the Royal Academy and he reigned over that institution from 1878 until his death in 1896. He was one of its greatest presidents, and made the opening of the

annual exhibition a leading social event.

At his elegant house, with its exotic "Arab Hall," Leighton received the best London society. His graciousness, genuine kindliness and perfect taste made his musical parties memorable occasions, and he was a constant diner-out at fashionable tables. Leighton's peerage, the first ever awarded to a painter, seemed the fitting climax to his career even if, sadly, he lived only a few weeks to enjoy it. Not everyone found his public persona to their liking. Henry James resented Leighton's financial and social success, "his sumptuosity, his personal beauty, his cleverness, his gorgeous house, his universal attainments, his portraits of duchesses, his universal parties, his perfect French and Italian—and German—his general air of being above all human dangers and difficulties!" and wrote a short story using him as one of the characters. There must have been others who wondered what lay behind the urbane

National Portrait Gallery, London

Lord Leighton, a leading painter and remarkable figure in Victorian England.

exterior. Had Leighton two lives, a public and a private, or had the mask of Olympian detachment become the real man as if he had come to assume the role he had set out to play?

Perhaps this emotional dichotomy should be pursued when we consider Leighton as artist. It may explain the rapid decline in popularity of his paintings, particularly his carefully composed classical set pieces and nudes. There is a chill, a brittleness, almost a heartless quality about these paintings which repels many viewers, even now when academic art has become respectable once more. They seem too impossibly remote from our own world to arouse our emotions. The lack of any passion in his languid females must appear almost an outrage to a generation which has to feel it is "committed" to some idea, however vague. What have the stillness and equilibrium of *The Syracusan Bride* or *The Garden of the Hesperides,* achieved by sensitive modulation of color and design, to say to our anything-but-quiet-and-stable world?

Yet if we are patient there is much to admire in Leighton's work. His paintings sometimes appear emotionally shallow, but they are always well thought out and the individual figures beautifully drawn, often the result of many preparatory drawings. Above all, he had a fine feeling for color and is at his best in decorative compositions like *Flaming June* (in the Ponce Art Museum in Puerto Rico), which glows with orange and yellow. Perhaps most immediately attractive are the many sketches Leighton made when on holiday, and which he painted solely for his own pleasure. They reveal another side to this very gifted artist and tell us that he did after all have an inner, private life, in spite of Henry James' doubts. Leighton's tragedy may have been to repress this side of his career to the detriment of his art.

—Ross Watson

Former curator of the Paul Mellon Collection, now a curator at the National Gallery of Art

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my craters wait for this continual boiling to rise, emerge, satisfy its instincts; for my incandescent passions to pour out, ignite and spread forth in an assault on the world. . . . If one wants to live in conformity with nature, one must take as a model floods, thunder and lightning . . . cyclones, volcanic eruptions."

Ionesco's generous essay begins as a reminiscence and ends as a full-throated paean to Vulcan, the god of fire: ". . . he is Agni, the fire god of the Vedic hymns; he is Regin, the armorer craftsman of Hialprek, king of Denmark; he is perhaps Satan. . . . He is still alive, hidden in the depths; he sneezes in his sleep and the earth's crust trembles; he smokes; he turns over and mountains spring up. . . ."

It is a masterpiece of hyperbole, and it is exactly right, for the volcano is hyperbole in action, after all. A detailed account of the 1973 eruption at Heimaey, Iceland, starts with "a gaping fissure that spits a curtain of molten lava more than 100 meters high" and goes on to describe the burial of a town and incredible efforts by men to fight the lava flow.

But the words, the careful and absorbing diagrams and analyses by Maurice and Katia Krafft, the somewhat syllable-

In crater of volcano, quiescent sin
1888, vented gases form myria

heavy poems by Max Gérard, even Ionesco's outpourings, cannot match the photographs.

First we are shown the quiescent craters, moonscapes, ominously smoking fantasies in twisted rock, weird lakes colored emerald green and inky black, ancient fissures whose depths reveal only a waiting darkness.

Then comes a series of overwhelming shots: the cloudlike tower of steam and ash that lofted five miles into the cold sky above Heimaey; the scene at the island itself, oddly resembling the famous photograph of the attack on Pearl Harbor; a mountain in the sea in the very act of exploding.

There is a brilliant night scene of a volcanic caldron out of which arch thousands of lava tracers; the pure orange jet blast of a strombolian eruption, which is very simply a monster explosion in the crater; the hellish splash of the Hawaiian-type volcano, flinging tatters and fragments of melted rock or roaring up in gigantic fountains like the fire storms of the sun.

Possibly even more exciting are the great double-page spreads of rivers and lakes of bright yellow molten stone flowing under red skies. And perhaps the most startling picture of all is the giant bubble at Strokkur, rising from the misty waters like some obscene creature, greenly translucent, glistening with menace, a moment before it explodes in a geyser of boiling water.

One section shows how men study volcanoes, sometimes standing on the brink of eruption. Another depicts the entire cycle, from the first belching roar to the lava flow to the desolate debris to the emergence of flowers among the pitted black rocks.

In most picture books one must choose between great pictures with disappointing text and scholarly text with mediocre pictures. This time, everything works. A spectacular book.

—*Michael Kernan*
Feature writer, *The Washington Post*

of small bubbles, creating a restless surface—Lipari Islands, Italy.

Revelations of New England Architecture
Photographs by Curt Bruce
Text by Jill Grossman
(Grossman Publishers, $15.95)
American Classic
Laurence Lafore
(Iowa State Historical Department/ Division of the State Historical Society
$5.95; $3.95 paperback)

Taken together these two books on regional American architecture almost span the history of our country, from the Puritan settlers through the Industrial Revolution in one book, and from the Industrial Revolution to the present in the other. In each the emphasis is on people and their buildings, on the way buildings reflect the lives and history of the people who build them—architecture as an expression of life, rather than architecture as an esoteric discipline practiced by professionals.

Jill Grossman makes that clear from the outset, her first sentence being: "Architects did not design and build most of the buildings in this book, the common people did." And the common people designed by adaptation. Log cabins would have suited their new land better, but the Puritans didn't know anything about log cabins, she says, so they did their best to re-create the traditional half-timbered houses in which they had grown up, adapting them to the new climate and the new and different mate-

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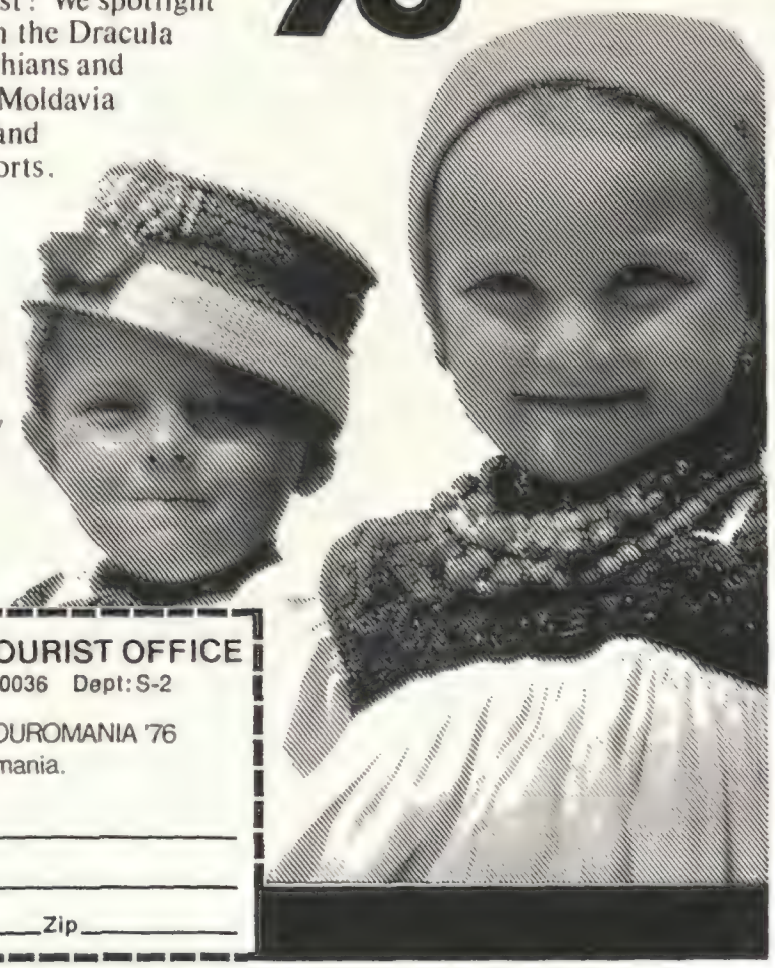

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rials that were available. In time, Puritan settlers' descendants became Yankee traders, and eventually Americans and their houses and buildings reflected the ever-changing lives of the people who lived, worked, played and prayed in them. As the Colonies began to copy, and adapt, the architectural styles of Europe, style and fashion took on increasing importance. From Colonial to Georgian to Federal to Greek Revival, Grossman and Bruce trace architectured styles and explore the social and economic forces that they reflect. They are both sensitive observers, and they complement each other: her text is impressionistic and evocative; his photographs, direct and documentary.

In 1839 a site for Iowa's new territorial capital city was chosen, and Iowa City was born—starting with log cabins of the sort that the Puritan settlers 200 years earlier had not known about. From that beginning, Iowa City grew into the classic American town of Laurence Lafore's book. Even though they started with log cabins, the inhabitants of Iowa City were riding the wave of the country's growth. They were soon influenced as much by fashion as by physical need, and over the years Iowa City became a collection of almost every conceivable

The Swisher house, 120 East Fairchild Street, Iowa City. Built in 1887, it is

architectural style, trend or influence.

Lafore's close look at Iowa City is similar in approach to Grossman's look at New England—reading the lives and times of the people through the buildings they built—although the time and geographic scale are different. Through his text and photographs, he illuminates the political, social and economic changes that shaped the town.

The two books illustrate the curious overlaps in our history—the recurrence of styles in different places and at different times that mark the westward movement of the country. But perhaps more interesting and more important are the two messages they bear. One is that no matter how many rules there may be in the realm of esthetics, the rules aren't always applied—at times with delightful results; mistakes, whims and quirks all contribute to the beauty and fascination of many of the buildings in both books. The other message is that architecture is not simply style, nor are buildings just shelter—they are the reflections of the needs and wants of people, a mirror of their times, and a glass in which we can see our past.

—Clint Page

Washington-based architectural writer

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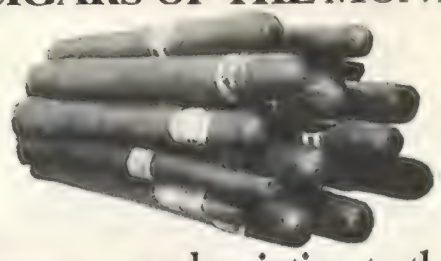

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Around the Mall and beyond

Like many north country Yankees, my father's friend Slocum was always an effective carpenter, able to reroof a barn, put up a woodshed and, as I can attest, turn out an exquisite little crossbow for a small boy. I can picture him straddling the ridgepole of the toolhouse he was building, nailing the rafters into place. The long spikes bit into the two-by-sixes, then sang their rising notes as they sank deeper with each clean blow of the hammer. The last echoing smack would drive the nailhead well into the sweet smelling wood, and he would say, "Theyah, by God. *She* ain't goin' anywheyah."

That was in New Hampshire. I am sure that down in Ipswich, Massachusetts, when other Yankees built a certain two-story house more than 250 years ago, they said much the same thing. Their rafters and joists and beams and posts were mortised into place. Some timbers were monstrous: one is 13-by-10½. Surely *she* wasn't goin' anywhere.

Yet, as it happens, she did. The so-called Hart House, built in Ipswich partly around the 1690s and partly about 1750, traveled all the way down to the Smithsonian's Museum of History and Technology, where she will soon be seen on exhibit.

The Hart House eventually will be part of a new entrance to the hall of Everyday Life in the American Past to show how a house was built in Colonial times. Its skeleton of posts and beams is exposed. Its outer skin of sheathing and clapboard is only partly applied, its inner surfaces of lath and plaster or pine paneling are incomplete.

Seen thus, the differences between the old section and the new (1750 is *new*?)

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stand out. The 17th-century ceilings are lower, and the second floor overhangs the first. Notches in the studs indicate that casement windows once went here. They are now reproduced. Wide pine planks form the outer shell.

The 18th-century section has sash windows, was sheathed with clapboards, and has lath and plaster to help insulate against the cold. Some interior walls have lovely pine paneling, but this, too, was covered with lath and plaster.

Anne Golovin, the associate curator in charge of this display, says that no paint was used on the siding. Planking and clapboards simply weathered. Inside, however, there are indications that the central beam that protruded through the white ceiling was originally red.

The two floors and loft are built around a huge central chimney—a mighty monolith of brick with many flues and fireplaces that formed the warm heart of the house, the core of all activity, the soul, as it were. The stairway climbs beside it, passing a deep niche left between two flues. Here a closet may have been placed on the upper floor and a storage space

maintained below, or perhaps it remained simply a half-forgotten hideyhole. I imagine generations of children discovering this alcove while playing "sardines," and I picture a child, sometimes on a bitter cold Massachusetts morning, pausing halfway up the stairs to spraddle against the chimney, embracing its warmth.

The great chimney once rested on field stones; the footing for the hearth, a giant slab of rock, carefully restored to be visible, can be seen even in the hall. How often have I seen them, the "centerpiece" of every cellar hole that ever came to light amid the blueberry bushes of a long run-down New England pasture.

Thinking about childhood sent me hurrying over to the National Collection of Fine Arts to look at the display of miniatures. It's not that miniatures are childish, but they're little and nice. This exhibit has been going for months, and I had a nasty feeling that it might close, but that's nonsense, says Robin Bolton-Smith, the assistant curator who runs it. The Doris M. Magowan Gallery of Portrait Miniatures is a permanent fixture, though a temporary exhibition will displace it next summer and autumn.

Miniatures, apparently, are not invariably tiny. The word stems from the kind of ink, minium, that was used to illustrate medieval manuscripts. The miniatures on exhibit, however, are satisfactorily small —tender little portraits that usually speak of love, done in thick watercolor on enamel or ivory or even metal.

There were many good American min-

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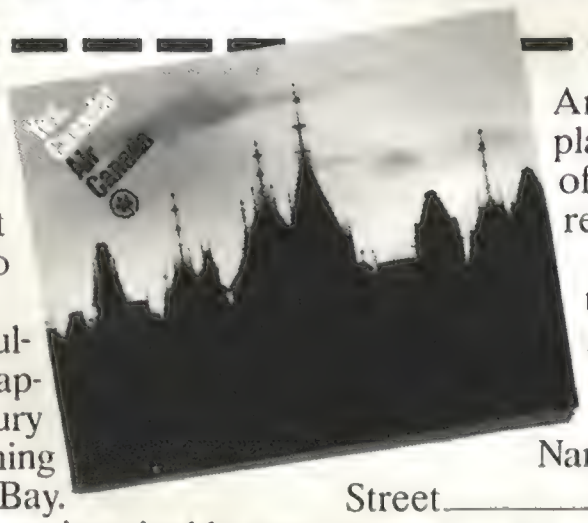

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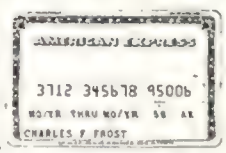

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iaturists, including three of the Peale family; Charles Willson, James and Raphaelle. My favorite, however, is an Englishman, Richard Cosway, whose wife Maria carried on a joyful and overt relationship with Thomas Jefferson while he was our minister to France after the Revolution. Many Jefferson scholars call it nothing more than a flirtation. I devoutly hope that it was the warm and happy affair that a lonely widower and a lovely, affectionate woman deserved.

The fact is that Maria's husband, the famous miniaturist, was a miniature himself. He was a tiny man, much older than his wife, whom he treated with cruelty. I doubt that the little toad was much fun to dance with. I'll bet Jefferson was.

Cosway was a superb miniaturist, perhaps because the scope came naturally to him. Possibly, had he attempted a full-sized canvas, it would have come out like a mural. Robin Bolton-Smith says she has a Cosway miniature, but not on display. It's too dull, she says. Not like the one he did of Maria, showing the blonde hair, limpid eyes and just a hint of naughtiness.

I left the miniatures to say hello to the painting of Emanuel Leutze, whose *Washington Crossing the Delaware* brought him unusual fame. He was an American of German parentage, but was living in Germany when he did this great patriotic painting, now on display with other Leutze works until later this month. And it *is* a fine painting—luminous in its lighting, stirring in its composition.

Leutze used the Rhine as his model and painted in ship's longboats, maybe 16 feet long, whereas actually the troops crossed in Durham boats of at least twice that length. General Washington gathered all the Durham boats along that stretch of the Delaware—a lot more than the 12 Leutze shows. The real river was about 1,000 feet wide at the crossing place—call it a quarter of a mile. The ice was in thick floes, but on the Delaware these were probably not more than six or eight inches through. Leutze shows ice floes standing 14 inches out of the water.

Washington had 2,400 men to get across before the morning of December 26, 1776. Leutze puts about a dozen in each of his 12 boats—that's 144 men per crossing. Moreover, Leutze's river is so wide that you can't make out the right bank; to be charitable, call it a mile wide. If the oarsmen had been able to make one mile an hour through that ice, they would have done well. This means that the 12 boats would have taken two hours for each two-way trip. To get 2,400 men across, plus 18 cannon (in 16-foot boats?), Leutze's assault would have required about 17 crossings, all of them round-trip except the last. This would have taken 37 hours. The Hessians would have grown bored with watching the day-and-a-half operation and capturing each convoy of 144 men. Washington's troops, whose enlistments were just about up, anyway, would have gone home for good.

The painting is marvelous just the same. Another one on exhibit is a portrait of Nathaniel Hawthorne that simply seems alive with humor and intelligence and interest. Hawthorne recalled his sitting with pleasure. The artist, apparently, took several breaks from the easel and poured champagne each time. "The best of fellows," Hawthorne called him, and I believe it.

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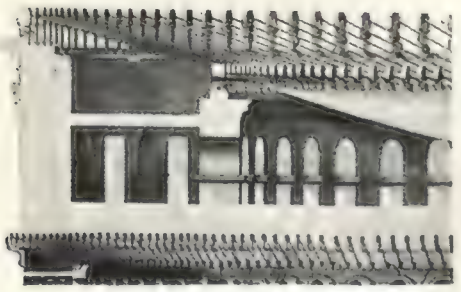

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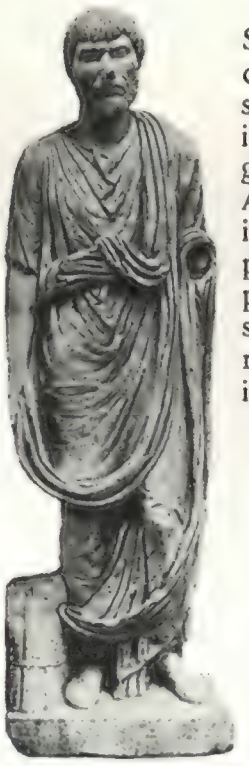
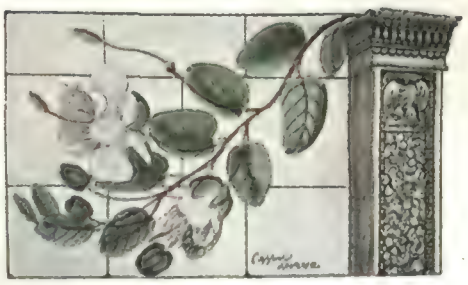


Symmachus, a 4th-century Roman noble, sponsored a notably ill-fated series of gladiatorial games. Among other calamities, the German prisoners he had imported as gladiators strangled each other rather than die in the arena.



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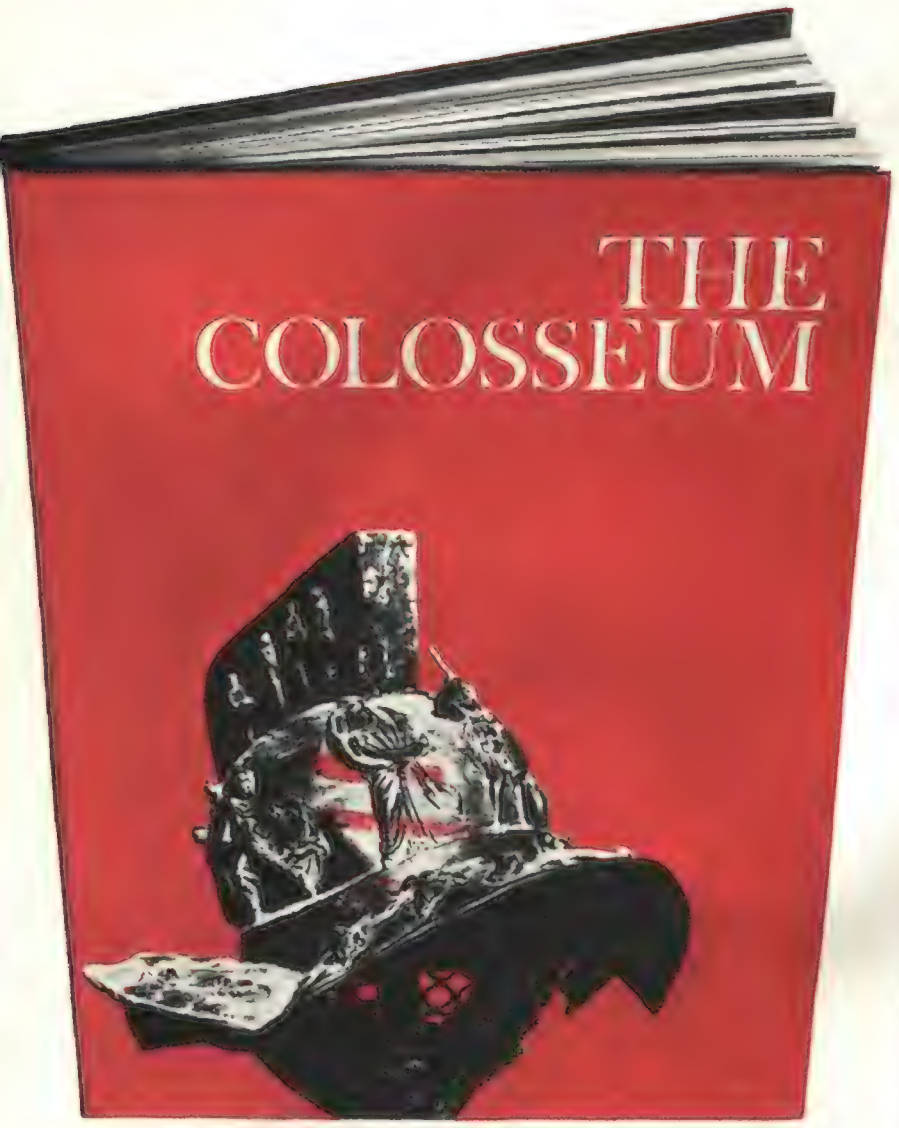

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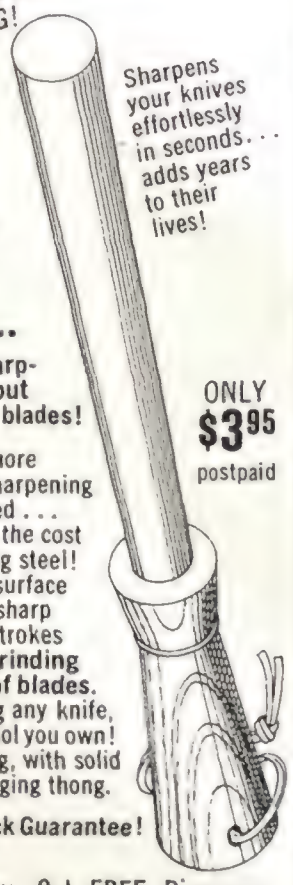

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Field Museum mural (p. 58)

Man in the Environment by Ruth Moore, Alfred A. Knopf, Inc., 1975

Chinese peasant art (p. 30)

China Today by Joan Lebold Cohen and Jerome Alan Cohen, Harry M. Abrams, Inc., 1974

Quotations from Chairman Mao Tse-tung, edited by Stuart R. Schram, Praeger Publishers, Inc., 1968

Brigade of the American Revolution (p. 40)

The Battles of Saratoga by John R. Cueno, Macmillan Company, 1967

Decision on the Hudson by John Luzader, Govt. Printing Office, 1975

The Command of the Howe Brothers During the American Revolution by Troyer Steele Anderson, Oxford University Press, 1936

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National Cancer Institute Monograph, Vol. 26, 1967

"HeLa-like Marker Chromosomes and Type-A Variant Glucose-6-phosphate Dehydrogenase Isoenzyme in Human Cell Cultures Producing Mason-Pfizer Monkey Virus-like Particles" by Walter A. Nelson-Rees, V. M. Zhdanov, P. K. Hawthorne, and Robert R. Flandermeyer, *Journal of the National Cancer Institute,* Vol. 53, No. 3, September 1974

"Introduction of Mouse-L Cell Nucleus in Heterologous Mammalian Cells" by K. K. Sethi and H. Brandis, *Nature,* Vol. 250, July 19, 1974

Theatre of the Deaf (p. 66)

The Deaf and Their Problems by Kenneth W. Hodgson, Franklin Watts, Inc., 1953

Deafness by David Wright, Stein and Day Publishers, 1969

Robert H. Goddard (p. 77)

This High Man by Milton Lehman, Farrar, Straus and Company, 1963

The Papers of Robert H. Goddard, Including the Reports to the Smithsonian Institution and the Daniel and Florence Guggenheim Foundation, edited by Esther C. Goddard, McGraw-Hill, Inc., 1970

Liberia (p. 82)

Tribe and Class in Monrovia by Merran Fraenkel, published for the International Institute by the Oxford University Press, 1964

Growth Without Development, An Economic Survey of Liberia by Robert W. Clower, George Dalton, Mitchell Harwitz, A. A. Walters, Northwestern University Press, 1966

Liberia, The Evolution of Privilege by J. Gus Liebenow, Cornell University Press, 1969

Art at MIT (p. 88)

Arttransition by MIT Center for Advanced Visual Studies and University Film Study Center, 1975 (catalog of the conference)

Hair jewelry (p. 97)

Victorian Jewellery Design by Charlotte Gere, William Kimber (London), 1972

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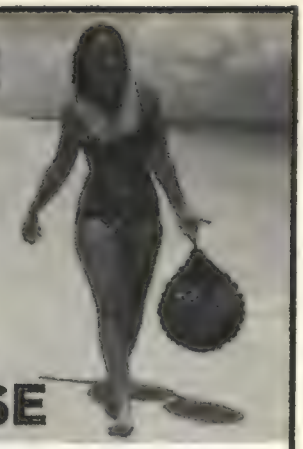

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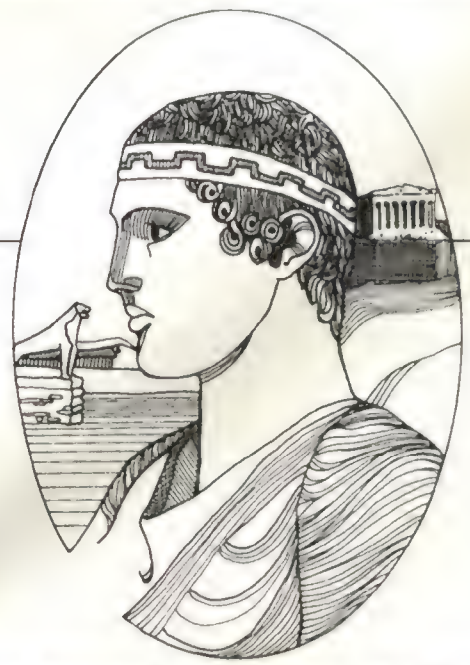

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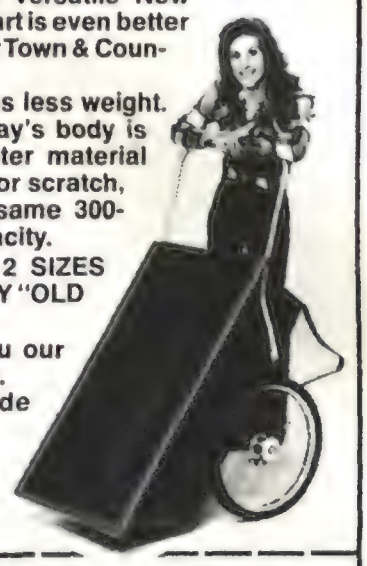

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Smithsonian highlights

Museum Fortnight in Cleveland
The Smithsonian National Associates "Regional Program," (see p. 168, November SMITHSONIAN) comes to Cleveland March 29-April 10. Cosponsored by various Cleveland area museums and private corporations, the "Museum Fortnight" presents major Smithsonian exhibitions and performances to Associates in the Cleveland metropolitan area. Invitations and detailed brochures will be sent to Associates by mid-March. Additional information will appear in the April issue.

Traveling Exhibition Service
The Smithsonian Institution Traveling Exhibition Service (SITES) has recently assembled new science and natural history exhibitions which are available to museums, schools and other cultural institutions in the United States. Science shows currently on view include:

- "Australia Goes Metric," a history of the metric system and a lively explanation of Australia's conversion to it (Platteville, Wisconsin, Wisconsin State University, March 6-April 4).
- "Problem Is Us," explaining the environmental implications of the world's explosive growth rate (Bay City, Michigan, Museum of the Great Lakes; and Columbus, Ohio, Ohio State University, March 1-28).

Science exhibitions available for rental include:

- "Man in His Environment," exploring major world concerns of energy, waste, food, population and limited resources.
- "Canyon Graphics and Graffiti," tracing the passage of Indians, Spaniards, explorers and traders through the canyon lands of Utah and Arizona by documenting petroglyphs, doodles, inscriptions and graffiti left behind.
- "Carl Jung," photographs of Jung and his family; reproductions of paintings by Jung and his patients; and an explanation of his life, his pioneering role as a therapist and his relationship to Freud.
- "Antarctica," photographs of the geography and animal life; original paintings depicting the strange beauty of the "white continent."

For information about bringing an exhibition to your community, write: Smithsonian Institution Traveling Exhibition Service, Washington, D.C. 20560.

Divisions of Performing Arts and Musical Instruments

- Snuffy Jenkins, one of the originators of the three-finger picking style, plays banjo with Don Reno, Bill Harrell on guitar, and Pappy Sherril on fiddle in the "American Banjo" series—March 7, 8 P.M., Baird Auditorium, Museum of Natural History.
- Innovative and widely known saxophonist Sam Rivers is the guest in the "Jazz Connoisseur" series—March 14, 6 P.M., Hirshhorn Museum Auditorium.
- The Stainsby Ensemble—Bernard Krainis, recorder; Nora Post, baroque oboe; Philip Levin, baroque bassoon; and Edward Brewer, harpsichord—plays pieces by Handel, Telemann and others—free workshop, March 14, 4 P.M.; concert, March 15, 8:30 P.M., Hall of Musical Instruments, Museum of History and Technology.
- The "American Popular Song" series presents the three surviving Mills Brothers in a concert of their favorite songs—March 21, 8 P.M., Baird Auditorium.
- Alan Curtis on harpsichord and Lucy van Dael on violin play baroque duets and a piece by Claude Balbatre—March 29, 8:30 P.M., Hall of Musical Instruments.

For information regarding tickets, discounts for senior citizens, students and Resident Associates, call (202) 381-5395.

National Collection of Fine Arts
A new, permanent gallery is opening March 19 at NCFA. Items from the John Gellatly Collection are included in the exhibition area. Sixteenth-century Renaissance jewels; 16th-century Chinese glass; 13th- and 14th-century ivories; 13th-century English alabaster; and an 18th-cen-

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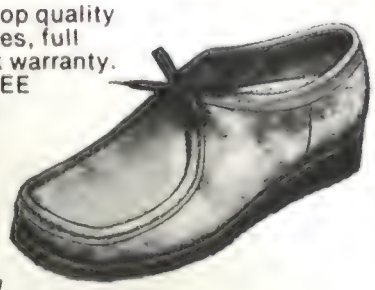

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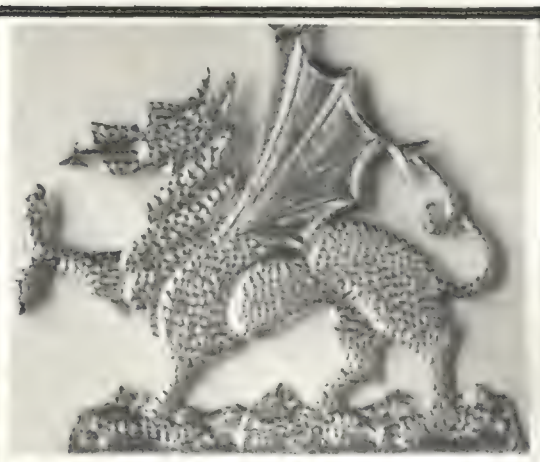

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Bicentennial Information

The Smithsonian Associates Museum Reference Service is available to Associates planning Bicentennial travel. Members may request a packet of lists of many of the museums, galleries and historical sites in the 13 original states. Please allow at least three weeks for mailing. Write: Museum Reference Service, Associates Reception Center, Smithsonian Institution Building, Washington, D.C. 20560.

Contributing Memberships

Associates who contribute $50 or more annually to the Smithsonian support the research and educational programs of the Institution. Among the special benefits available to Contributing Members are:

- publications by Smithsonian Institution scholars
- the Secretary's annual report
- specially planned programs

For additional information, write: Contributing Membership Program, A&I 1208, Smithsonian Institution, Washington, D.C. 20560.

Anacostia Neighborhood Museum

"Black Women: Achievements Against the Odds" examines the roles, contributions and achievements of black women in many phases of American life since Colonial times. More than 100 women are highlighted in the show, including Gwendolyn Brooks, Lorraine Hansberry, Mary McLeod Bethune and Mary Church Terrell—through April 25.

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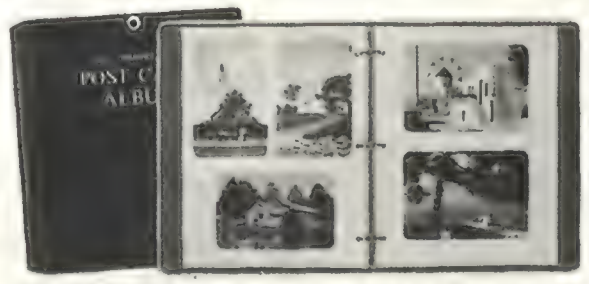

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Musical Weekend
The fifth annual Musical Weekend, sponsored by the Division of Musical Instruments and the Friends of Music at the Smithsonian, will be held May 14-16. Reservations are now being accepted for this very popular event.

The weekend begins with a dinner in the historic Smithsonian castle building, followed by a performance and reception at the Kennedy Center. Also included are tours of the Museum's Bicentennial exhibitions and a reception at one of the city's beautiful foreign embassies. A concert played on antique instruments from the Smithsonian's collection, as well as other concerts in a variety of settings, are part of this weekend, especially designed for music-lovers. For information, write: Musical Weekend, Museum of History and Technology, Room 4123, Washington, D.C. 20560.

Winter Museum Hours
The Arts and Industries Building, former home of the *Spirit of St. Louis,* the "moon rock" and the Apollo 11 command module, is closed for Bicentennial renovation. Other Smithsonian buildings are open daily from 10 A.M. to 5:30 P.M. The National Zoo is open from 9 A.M. to 4:30 P.M. daily.

Parking for Visitors
A garage under the new Air and Space Museum is now open to the public. The entrance is on 7th Street, between Independence Avenue and Jefferson Drive.

Smithsonian Commons
The Commons is now open on weekends for Associates and their families, offering a buffet luncheon for $3.25, with a reduced rate for children. Beverages and desserts are optional. Hours are 11:15 A.M. to 2:15 P.M. seven days a week.

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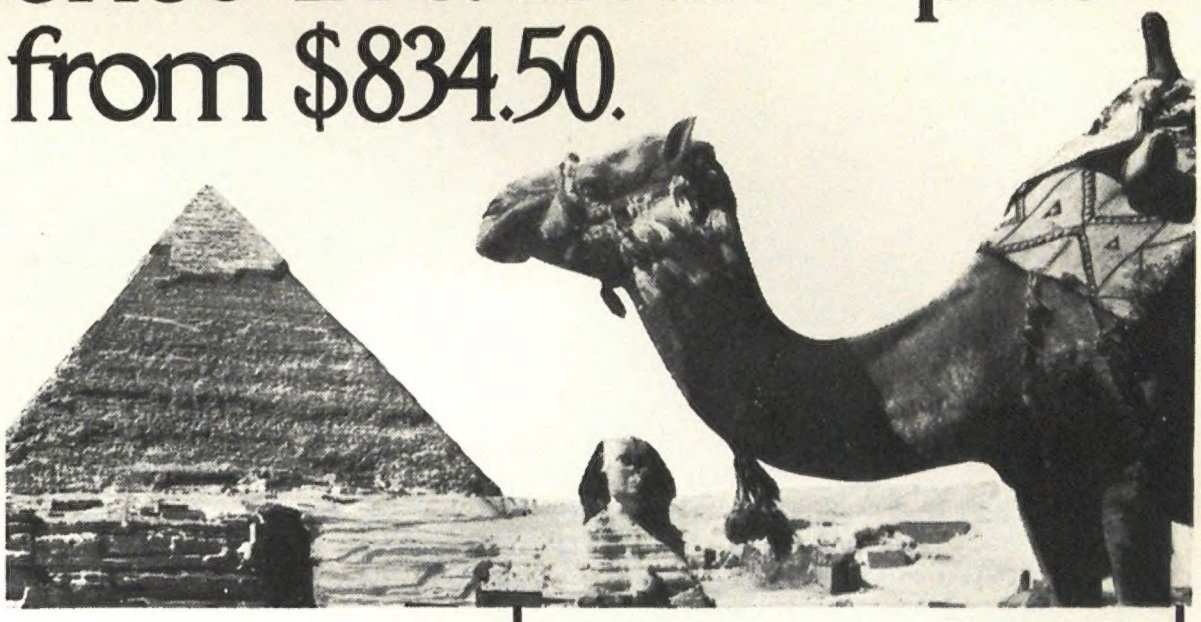

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Pssst! A hot dinosaur?

By Patrick Ryan

In decade of the big steal, larceny waxes grander

The annals of nefarious folklore have long heralded the legendary exploits of Parisian con men in persuading visiting tycoons to hand over large deposits of folding money for first options on the right to dismantle the Eiffel Tower and sell its components for scrap.

With the escalating pretensions to ill-gotten magnitude that currently beset leading practitioners in larceny, the day may soon be here when the sting-merchants take their victims to view the eponymous edifice of Alexandre Gustave Eiffel, only to be confronted by an empty skyline—because some earlier-bird colleagues-in-crime pinched it overnight.

The 20th-century obsession with bigness in business, buildings and airplanes seems to have infected our light-fingered brethren. The illegal abduction of ever-larger objects has become an international ambition among the fraternity of thieves. Across the Atlantic, predaceous elephantiasis afflicts the latter-day descendants of Bill Sikes. With the boom in mighty building in the Middle East, a ready market is now available for big-thinking criminals who specialize in knocking off bulldozers, excavators and those mammoth earth scrapers which in five minutes can desolate a green valley into a wilderness of brown hell. The British construction industry rates its losses to these heavy-handed marauders as running at more than $200 million a year. Which might lately have been more, but for the assiduity of the police when a 50-ton crane, alone worth $120,000, was whipped from a big construction site in northern England. They found it resting at an East Coast dock awaiting shipment to the Continent for intended sale to a German firm which had, in good faith, advertised for such a lifting monster.

This weight of felony was topped, however, by two villains in Islington, London, who were haled into court for willfully stealing a couple of public streets. They were caught blister-handed after they had dug up 71 tons of paving stones to sell to a construction firm for more than $2,200.

Their attainment of so high a tonnage was greatly assisted by the fact that passing English pedestrians, from under whose very feet they were purloining the pavement, could not remonstrate about their actions because they had not been formally introduced. But even this herculean larceny was outdone single-handedly by a tenacious Yorkshireman who, over a period of two months, patiently demolished a complete country railway station and used its remains as hardcore for the foundations of some mighty project. That the building was no longer in use probably encouraged him to this unusual endeavor, but the railway line on which it stood continued to be a busy track and no passing engineer raised the slightest "whooee-too-whooee" at the daily prospect of the diminishing station.

Down and over in Argentina, a band of swift and nocturnal engineering bandits put a decisive spike in the public transport system when they demolished a complete iron bridge overnight. Next morning, the appropriate officials no doubt noted the loss when traffic built up on the bridge approaches, and advised the police that the vital arch had gone down the Rio Paraná. The gendarmes managed to catch the receiving scrap merchant with the ferrous bones of the bridge still blatantly in his possession, but not the midnight dismantlers.

The biggest holdup in literal communication that has crossed my ken was perpetrated by a postman in Newington, Connecticut, who was lately found by federal investigators to have more than three tons of other people's mail stashed away in his attic. "There was everything," an official reported, "from baby food to Christmas cards. Anything that has ever been sent through the mail was there."

But perhaps the individual laurels in this field of Olympian purloining go to a 71-year-old from Fergus, Ontario, who was apprehended and charged with stealing nine pints of frozen bull sperm. It's not the simple quantity of bovine fertility that commands admiration, but the teeming potential of its appropriate application. Nine pints of beefy yo-ho-ho distributed in standard dilution among sufficient brown cows could rapidly provide a greater herd of cattle than even John Wayne could round up, thus presenting a man with enough tonnage on the hoof to make him King of the Wild Prairie, Master of the Beef Mountain, and Lord of the Bull Rings.

Sadly for the Canadian champ, however, his colleagues in the league of big stealers soon will be back in competition for top place in gargantuan dishonors. So do keep a wary eye on the Statue of Liberty, won't you, while I stand 24-hour watch over Big Ben.

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